

Biological Assessment for the Re-Initiation of Consultation from the Proposed Military Relocation to Guam

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Acronyms and Abbreviations

ac	acre(s)	LCAC	Landing Craft Air Cushion
ACE	Air Combat Element	LFTRC	Live-Fire Training Range Complex
AFB	Air Force Base	LEED	Leadership in Energy and Environmental Design
AGL	above ground level	m	meter(s)
AMC	Air Mobility Campus	m ²	square meter(s)
APHIS	Animal and Plant Health Inspection Service	mm	millimeter(s)
BA	Biological Assessment	MBP	Micronesia Biosecurity Plan
BMP	Best Management Practice	MCO	Marine Corps Order
BO	Biological Opinion	MEC	Munitions and Explosives of Concern
BOWTS	Bilge Oily Waste Treatment System	MEF	Marine Expeditionary Force
BTS	brown treesnake(s)	MEU	Marine Expeditionary Unit
CFR	Code of Federal Regulations	mi	mile(s)
cm	centimeter(s)	mi ²	square mile(s)
CNMI	Commonwealth of the Northern Mariana Islands	min	minute(s)
COMNAV	Commander Navy Region	MIRC	Mariana Islands Range Complex
CWCS	Comprehensive Wildlife Conservation Strategy	MLLW	mean lower low water
DAWR	Guam Department of Aquatic and Wildlife Resources	MOA	Memorandum of Agreement
DFW	CNMI Division of Fish and Wildlife	MSA	Munitions Storage Area
DoD	Department of Defense	MWDK	Military Working Dog Kennel
DON	Department of Navy	NAVFAC	Naval Facilities Engineering Command
EA	Environmental Assessment	NCTS	Naval Computer and Telecommunication Site
ECM	earth covered magazine	NEPA	National Environmental Policy Act
EIS	Environmental Impact Statement	NISC	National Invasive Species Council
ERA	Ecological Reserve Area	NMFS	National Marine Fisheries Service
ESA	Endangered Species Act	NMS	Naval Munitions Site
ESQD	Explosive Safety Quantity Distance	NR	Natural Resources
FAA	Federal Aviation Administration	NWR	National Wildlife Refuge
FDM	Farallon de Medinilla	OEIS	Overseas Environmental Impact Statement
ft	foot/feet	OPNAVINST	Chief of Naval Operations Instruction
ft ²	square foot/feet	oz	ounce(s)
FY	fiscal year	POV	personal-owned vehicle
g	gram(s)	RBP	Regional Biosecurity Plan
GovGuam	Government of Guam	SEIS	Supplemental Environmental Impact Statement
HACCP	Hazard Analysis and Critical Control Point	SDZ	Surface Danger Zone
ha	hectare(s)	USACE	U.S. Army Corps of Engineers
HQ	Headquarters	USC	U.S. Code
in	inch(es)	USDA	U.S. Department of Agriculture
INRMP	Integrated Natural Resources Management Plan	USFS	U.S. Forest Service
ISR	Intelligence, Surveillance, and Reconnaissance	USFWS	U.S. Fish and Wildlife Service
JGPO	Joint Guam Program Office	USGS	U.S. Geological Survey
km	kilometer(s)	UXO	Unexploded Ordnance
km ²	square kilometer(s)	yd	yard(s)
lb	pound(s)		

EXECUTIVE SUMMARY

On September 8, 2010, the U.S. Fish and Wildlife Service (USFWS) issued its Biological Opinion (BO) (2010-F-0122) for the relocation of certain elements of the United States (U.S.) Marine Corps from Okinawa to Guam (as outlined in the May 2006 Realignment Roadmap). The BO addressed the preferred alternative in the Final Environmental Impact Statement (FEIS) for the “Guam and Commonwealth of the Northern Mariana Islands Military Relocation; Relocating Marines from Okinawa, Visiting Aircraft Carrier Berthing, and Army Air and Missile Defense Task Force,” dated July 2010. A Record of Decision (ROD) for the FEIS was signed on September 20, 2010 (75 FR 60438, September 30, 2010).

On April 27, 2012, the U.S.-Japan Security Consultative Committee (SCC) issued a joint statement announcing its decision to adjust the plans outlined in the May 2006 Realignment Roadmap. In accordance with the SCC’s adjustments, the DoD adopted a new force posture in the Pacific providing for a materially smaller force on Guam. Specifically, the adjustments include reducing the originally planned relocation of approximately 8,600 Marines and 9,000 dependents to a force of approximately 5,000 Marines and approximately 1,300 dependents on Guam. That decision prompted the DON’s review of the major actions previously planned for Guam and approved in the September 2010 ROD and addressed in the September 2010 BO. This review concluded that while some actions remain unchanged as a result of the smaller force size, others, such as the main cantonment and family housing areas, could significantly change as a result of the modified force. The DON has opted to address these changes in a **Supplement** Environmental Impact Statement (SEIS) (77 FR 61746, October 11, 2012) and this Biological Assessment (BA).

The proposed reduction in the size of the new force structure does not affect all of the decisions that were made in the September 2010 ROD. The potential environmental effects of these actions were fully and accurately considered and analyzed in the 2010 FEIS. For those decisions that are not affected by the new force structure, the September 2010 ROD stands as the final agency action for those elements.

Based on the evaluation presented in this BA, the DON has made the following determinations (Table ES-1):

Table ES-1. Threatened and endangered species addressed in this Biological Opinion and their Effects Determinations

Common Name	Scientific Name	ESA Status	Affects Determination
Mariana fruit bat	<i>Pteropus mariannus mariannus</i>	Threatened	Likely to Adversely Affect
Mariana crow	<i>Corvus kubaryi</i>	Endangered	Likely to Adversely Affect (habitat only)
Guam rail	<i>Gallirallus owstoni</i>	Endangered	Likely to Adversely Affect (habitat only)
Guam Micronesian kingfisher	<i>Todiramphus [=Halcyon] cinnamominus cinnamominus</i>	Endangered	Likely to Adversely Affect (habitat only)
Green sea turtle	<i>Chelonia mydas</i>	Threatened	May Affect, Not Likely to Adversely Affect
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered	May Affect, Not Likely to Adversely Affect
Hayun lagu	<i>Serianthes nelsonii</i>	Endangered	May Affect, Not Likely to Adversely Affect
Mariana eight-spot butterfly	<i>Hypolimnys octocula mariannensis</i>	Proposed?	May Affect, Not Likely to Adversely Affect
	<i>Tabernaemontana rotensis</i>	Proposed?	May Affect, Not Likely to Adversely Affect
	<i>Cycas micronesica</i>	Proposed?	May Affect, Not Likely to Adversely Affect

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**BIOLOGICAL ASSESSMENT
FOR THE RE-INITIATION OF CONSULTATION
FOR THE
PROPOSED MILITARY RELOCATION TO GUAM**

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CHAPTER 1

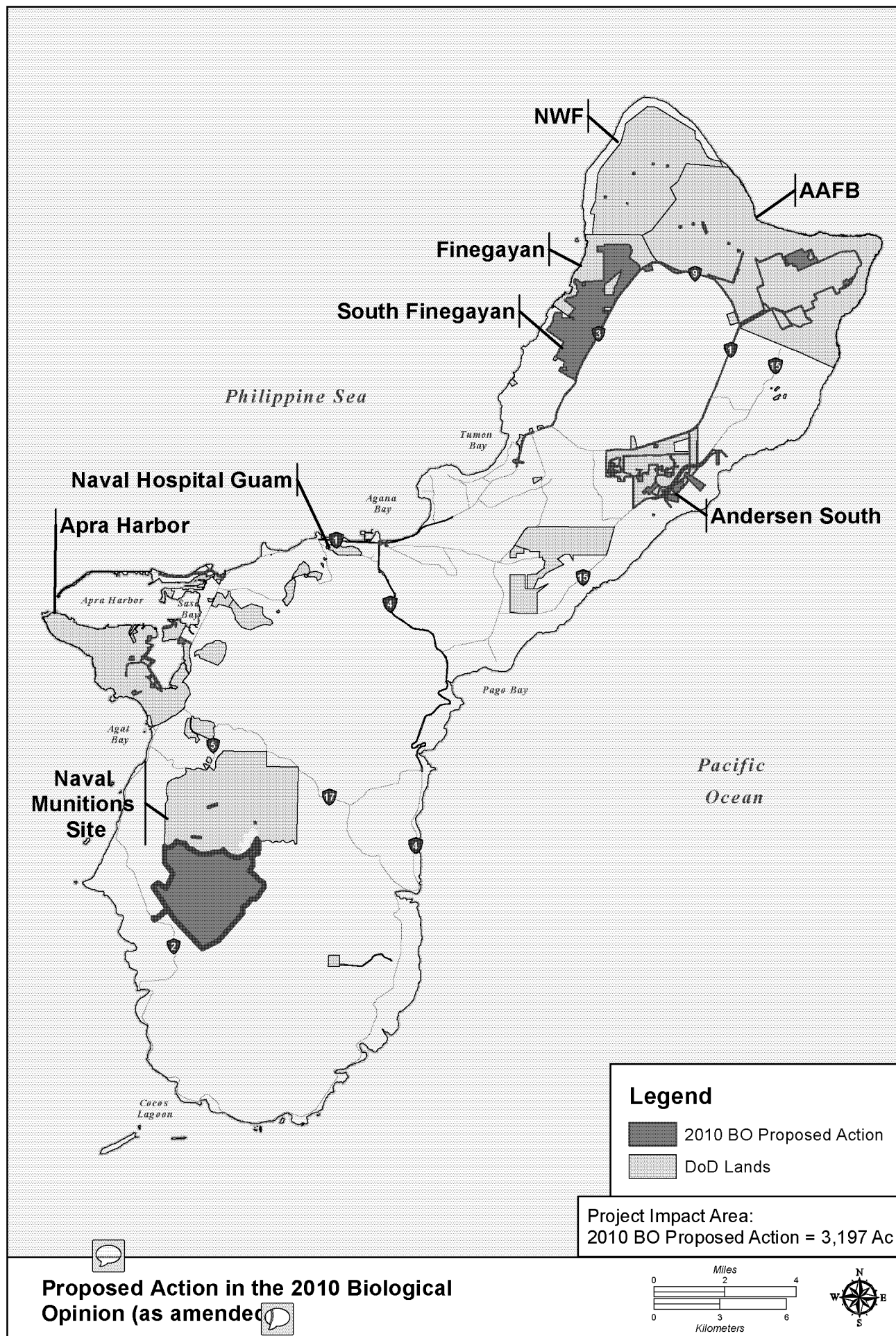
INTRODUCTION

On September 8, 2010, the USFWS issued its Biological Opinion (BO) (2010-F-0122) for the Joint Guam Program Office Relocation of the U.S. Marine Corps from Okinawa to Guam (as outlined in the May 2006 Realignment Roadmap). The BO addressed the preferred alternative in the Final Environmental Impact Statement (FEIS) for the “Guam and Commonwealth of the Northern Mariana Islands Military Relocation; Relocating Marines from Okinawa, Visiting Aircraft Carrier Berthing, and Army Air and Missile Defense Task Force,” dated July 2010. A Record of Decision (ROD) for the FEIS was signed on September 20, 2010 (75 FR 60438, September 30, 2010).

In the months following the issuance of the ROD, the Department of the Navy (DON) made adjustments with regards to the live-fire training range complex, including application of probabilistic method that reduced the overall footprint of the Multi-Purpose Machine Gun range. The DON initially elected to prepare a Supplemental Environmental Impact Statement (SEIS) limited solely to the evaluation of impacts associated with the location, construction, and operation of the live fire training range complex (77 FR 6787, February 9, 2012). On April 27, 2012, the U.S.-Japan Security Consultative Committee (SCC) issued a joint statement announcing its decision to adjust the plans outlined in the May 2006 Realignment Roadmap. In accordance with the SCC’s adjustments, the DoD adopted a new force posture in the Pacific providing for a materially smaller force on Guam. Specifically, the adjustments include reducing the originally planned relocation of approximately 8,600 Marines and 9,000 dependents to a force of approximately 5,000 Marines and approximately 1,300 dependents on Guam. That decision prompted the DON’s review of the major actions previously planned for Guam and approved in the September 2010 ROD and addressed in the September 2010 BO. This review concluded that while some actions remain unchanged as a result of the smaller force size, others, such as the main cantonment and family housing areas, could significantly change as a result of the modified force. The DON has opted to address these changes in a SEIS (77 FR 61746, October 11, 2012) and this BA.

As discussed above, the proposed reduction in the size of the new force structure does not affect all of the decisions that were made in the September 2010 ROD. The relocation of the Marine Corps Aviation Combat Element facilities to AAFB, the development of the North Gate and access road at AAFB, Apra Harbor wharf improvements, and the non-live-fire training ranges on Andersen South remain unaffected by the changes in force structure resulting from the April 2012 Roadmap adjustments. These actions will occur no matter where on Guam the main cantonment and family housing areas and live-fire training range complex are situated. The potential environmental effects of these actions were fully and accurately considered and analyzed in the 2010 Final EIS. For those decisions that are not affected by the new force structure, the September 2010 ROD stands as the final agency action for those elements.

In 2011, DON requested to amend the 2010 BO to address the changes in the program (Figure 1-1). The USFWS responded recognizing the need to delay implementing some of the conservation measures. In September of 2012, DON notified the USFWS of its plans to request a second amendment to the BO due to funding restrictions affecting the implementation of the conservation measures as well as the changes in the overall project description. Section of the FY12 NDAA (Public Law 112-81) stated “. . . none of the funds authorized to be appropriated under this Act . . . may be obligated to implement the realignment of United States Marine Corps forces from Okinawa to Guam.” On October 12, 2012, the USFWS stated that a re-initiation request and BA (versus an amendment to the BO) was necessary to address the changes in the project description. In April of 2013, DON submitted a BA with a conclusion that the interim



Proposed Action in the 2010 Biological
Opinion (as amended)

actions would “not likely to adversely affect” the Mariana fruit bat. DON’s request for re-initiation focused only on those species extant on Guam and did not include species that are listed under the Endangered Species Act but extirpated on Guam. JGPO could find no legal basis requiring consultation on extirpated species not present in the proposed action area based on its thorough research of existing USFWS regulations, policies, publically available guidance, and case law. After a series of meetings and conference calls, the USFWS acknowledged that current regulations and published USFWS guidance do not specifically address extirpated species, the USFWS advised the DON that consultation on effects to currently extirpated species is not unprecedented and is appropriate in this instance as the effects of the Proposed Action are likely to persist and overlap the period when reintroduction of the currently extirpated species on Guam is reasonably certain to occur and the species are likely to be exposed to the effects of the Proposed Action should it be implemented. On September 10, 2013, in anticipation of the Section 7 consultation for the SEIS, the DON sent a request to the USFWS for concurrence on the list of federally listed species and designated critical habitat present within the U.S. territory of Guam. The USFWS responded on September 20, 2013 with a species list (Table 1-1). The DON has prepared this BA to re-analyze the potential impacts on federally listed threatened and endangered species under the jurisdiction of the USFWS from DON actions addressed in the FEIS that are not affected by the April 2012 SCC joint statement and the actions addressed in the draft SEIS.

Table 1-1. USFWS Species List for the Guam and Commonwealth of the Northern Marianas Islands (Tinian) Military Relocation

Common Name	Scientific Name	ESA Listing Status	Islands
Hayun lagu	<i>Serianthes nelsonii</i>	Endangered	Guam
Mariana fruit bat*	<i>Pteropus mariannus mariannus</i>	Threatened	Guam, Tinian
Mariana swiftlet	<i>Aerodramus bartschi</i>	Endangered	Guam
Mariana crow*	<i>Corvus kubaryi</i>	Endangered	Guam ¹
Mariana common moorhen	<i>Gallinula chloropus guami</i>	Endangered	Guam, Tinian
Guam rail	<i>Gallirallus owstoni</i>	Endangered	Guam ¹
Micronesian megapode	<i>Megapodius laperouse</i>	Endangered	Tinian
Guam Micronesian kingfisher*	<i>Todiramphus cinnamominus cinnamominus</i>	Endangered	Guam ¹
Green sea turtle ²	<i>Chelonia mydas</i>	Threatened	Guam, Tinian
Hawksbill sea turtle ²	<i>Eretmochelys imbricate</i>	Endangered	Guam, Tinian
Mariana eight-spot butterfly	<i>Hypolimnna octocula mariannensis</i>	C	Guam
	<i>Tabernaemontana rotensis</i>	SOGCN	Guam
	<i>Cycas micronesica</i>	SOGCN	Guam

*Critical habitat for the Mariana fruit bat, Mariana crow, and Guam Micronesian kingfisher has been designated on the Guam National Wildlife Refuge.

¹Extirpated in the wild on Guam. Sufficient habitat is needed for recovery which includes the re-establishment of these species in the wild on Guam.

²Only includes species utilizing terrestrial resources (e.g., turtle nesting on beaches).

DON has prepared this BA to re-analyze the potential impacts on federally listed threatened and endangered species under the jurisdiction of the USFWS from DON actions addressed in the FEIS that are not affected by the April 2012 SCC joint statement and the actions addressed in the draft SEIS.

1.1 BACKGROUND

On September 8, 2010, the USFWS issued its BO (USFWS 2010a) for the Joint Guam Program Office Relocation of the U.S. Marine Corps from Okinawa to Guam. The BO concluded that after reviewing the current status of the listed species, the environmental baseline, the effects of the Proposed Action and the cumulative effects, the action, as proposed was not likely to jeopardize the continued existence of the Guam Micronesian kingfisher, Guam rail, Mariana common moorhen, Mariana crow, and Mariana fruit bat.

The BO anticipated incidental take may occur to the Mariana common moorhen and the Mariana fruit bat as a result of the Proposed Action. The incidental take was for the following species and actions:

- 1) Four Mariana common moorhens may be incidentally taken in the form of harassment on days when construction and live-fire exercises occur at the proposed Tinian firing ranges.
- 2) Up to ten remaining Mariana fruit bats at the Pati Point natural area colony will be taken in the form of harassment due to loud aircraft noise resulting from the Proposed Action.

The effect on the Mariana fruit bat of ongoing and increased noise resulting from increased jet aircraft and helicopter use of the main runways at Andersen Air Force Base was also analyzed in the Intelligence, Surveillance, and Reconnaissance Strike (ISR) BO (USFWS 2006). In that consultation, the USFWS expected that noise effects would adversely affect the Mariana fruit bat to the extent that the nearby Pati Point colony would be abandoned by the 21 bats estimated to remain there in 2006. The USFWS determined that fruit bats relocating from Pati Point to other, less-protected areas on the island likely would be shot opportunistically by hunters (USFWS 2006). The USFWS concluded that the remaining fruit bats on Guam would be taken as a result of the ISR Strike Proposed Action, but that this take would not jeopardize the continued overall existence of the Mariana fruit bat (USFWS 2006).

1.2 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The overarching need for the Proposed Action is to locate U.S. military forces within a timely response range to meet international agreement and treaty requirements and to fulfill U.S. policy to provide mutual defense, deter aggression, and dissuade coercion in the Western Pacific Region.

The Proposed Action described herein addresses those decisions that were made in the September 2010 ROD that remain unaffected by the changes in force structure resulting from the April 2012 Roadmap adjustments and the Proposed Action as described in the draft SEIS.

For a more detailed discussion of the purpose of and need for the Proposed Action, please refer to the:

2010 FEIS, specifically Chapter 1 in each of the following volumes:

- Volume 1 (Overview of Proposed Action and Alternatives)
- Volume 2 (Marine Corps Relocation – Guam)
- Volume 6 (Related Actions – Utilities and Roadway Projects)

And

2014 draft SEIS, specifically:

- Chapter 4.1 Finegayan Cantonment/Housing – Alternative A

- Chapter 5.5 Northwest Field Live-Fire Training Complex – Alternative 5

1.3 SPECIES ADDRESSED IN THIS BA

Section 7(a)(2) of the Endangered Species Act states, “Each Federal agency shall, in consultation with and with the assistance of the Secretary of the Interior, insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species.” To “jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. [50 CFR §402.02]

In order to evaluate the effects of a Proposed Action on a listed species or critical habitat, a federal agency must initially determine what species or critical habitat is/are present in the action area. The action area comprises “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR § 402.02).” For major construction activities such as the Proposed Action, the DON must communicate with USFWS in writing to identify the species that are present in the action area. As part of this identification process for the Proposed Action, the DON and the USFWS discussed whether the Section 7 consultation process should continue to include those ESA-listed species which are extirpated from the action area, which in this instance comprises the entire island of Guam. The USFWS defines an extirpated species as a species no longer surviving in regions that were once part of its range (USFWS 2013a). However, they are not extinct and exist in other parts of the world; they may also be found in zoos or aquaria.

The DON initiated this discussion given its inability to identify any legal authority which would require consultation on extirpated listed species. Acknowledging that current regulations and published USFWS guidance do not specifically address extirpated species, the USFWS advised the DON that consultation on effects to currently extirpated species is not unprecedented and is appropriate in this instance as the effects of the Proposed Action are likely to persist and overlap the period when reintroduction of the currently extirpated species on Guam is reasonably certain to occur and the species are likely to be exposed to the effects of the Proposed Action should it be implemented. The USFWS further noted that the situation regarding the Proposed Action could be distinguished from a project that would be completed in the near term and where the effects of the action are not likely to persist and overlap the period when reintroduction of the currently extirpated species is reasonably certain to occur. In such instances, consultation may not need to include extirpated species.

The threatened or endangered species that are present within the Action Area of the actions covered in the scope of this BA are listed below in Table 1-2.


Table 1-2. Species Addressed in this Biological Assessment

Common Name	Scientific Name	ESA Listing Status	Islands
Hayun lagu	<i>Serianthes nelsonii</i>	Endangered	Guam
Mariana fruit bat*	<i>Pteropus mariannus mariannus</i>	Threatened	Guam, Tinian
Mariana crow*	<i>Corvus kubaryi</i>	Endangered	Guam ¹
Guam rail	<i>Gallirallus owstoni</i>	Endangered	Guam ¹
Guam Micronesian kingfisher*	<i>Todiramphus cinnamominus cinnamominus</i>	Endangered	Guam ¹
Green sea turtle ²	<i>Chelonia mydas</i>	Threatened	Guam, Tinian
Hawksbill sea turtle ²	<i>Eretmochelys imbricate</i>	Endangered	Guam, Tinian
Mariana eight-spot butterfly	<i>Hypolimnas octocula mariannensis</i>	C	Guam
	<i>Tabernaemontana rotensis</i>	SOGCN	Guam
	<i>Cycas micronesica</i>	SOGCN	Guam

1.4 Species Eliminated from Detailed Analysis

In their September 20, 2013 letter, the USFWS identified 10 species as species “that may be affected by your [our] proposed project.” Three (3) of those species have been excluded from analysis within this BA because either: (1) the DON has determined that the revised Proposed Action would not affect the species or (2) the species are not present in the Action Area (Table 1-3).

The Mariana swiftlet, Mariana common moorhen and Micronesian megapode are listed as endangered and occur on Guam and Tinian, however, the DON has determined that the Proposed Action would not affect these species and all are excluded from analysis within this BA. The DON has reached this conclusion because construction activities addressed in this BA are not sufficiently proximate to directly or indirectly affect individuals of the aforementioned species in the terrestrial environment. The Micronesian megapode is excluded from analysis because they are found on Tinian and therefore are not within the action area [Guam].

Table 1-3. Species Eliminated from Analysis in this Biological Assessment 

Common Name	Scientific Name	ESA Listing Status	Islands
Mariana swiftlet	<i>Aerodramus bartschi</i>	Endangered	Guam
Mariana common moorhen	<i>Gallinula chloropus guami</i>	Endangered	Guam, Tinian
Micronesian megapode	<i>Megapodius laperouse</i>	Endangered	Tinian

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CHAPTER 2

PROPOSED ACTION AND CONSERVATION MEASURES

2.1 PROPOSED ACTION

The purpose of the Proposed Action is to ensure that the relocated Marines are organized, trained, and equipped as mandated by 10 USC § 5063, to satisfy individual live-fire training requirements as described in the 2010 Final EIS and associated ROD, and to establish an operational Marine Corps presence on Guam in accordance with the April 2012 Roadmap Adjustments. The purpose remains unchanged from the 2010 Final EIS, albeit to support a materially smaller relocating Marine Corps force.

The Proposed Action is needed to ensure consistency with the new force posture adopted by the DoD in accordance with the April 2012 Roadmap Adjustments, which provide for a materially smaller force on Guam than was originally proposed in the 2010 Final EIS, while fulfilling U.S. national security obligations to provide mutual defense, deter aggression, and dissuade coercion in the Western Pacific Region (Figure 2-1).

The Proposed Action is to construct and operate a cantonment area, including family housing, and a LFTRC on Guam to support the Marine Corps relocation. These requirements include a cantonment area (with family housing and community support facilities) of sufficient size and functional organization to accommodate the reduced number of Marines relocating to Guam per the 2012 Roadmap Adjustments, and an LFTRC that allows for simultaneous use of firing ranges to support training and operations of the relocated Marines. The Proposed Action also includes the provision of on-site utilities, access roads, and related off-site infrastructure to support the cantonment/family housing and LFTRC (Table 2-1).

Table 2-1. Description of Proposed Action as described in the 2014 draft SEIS


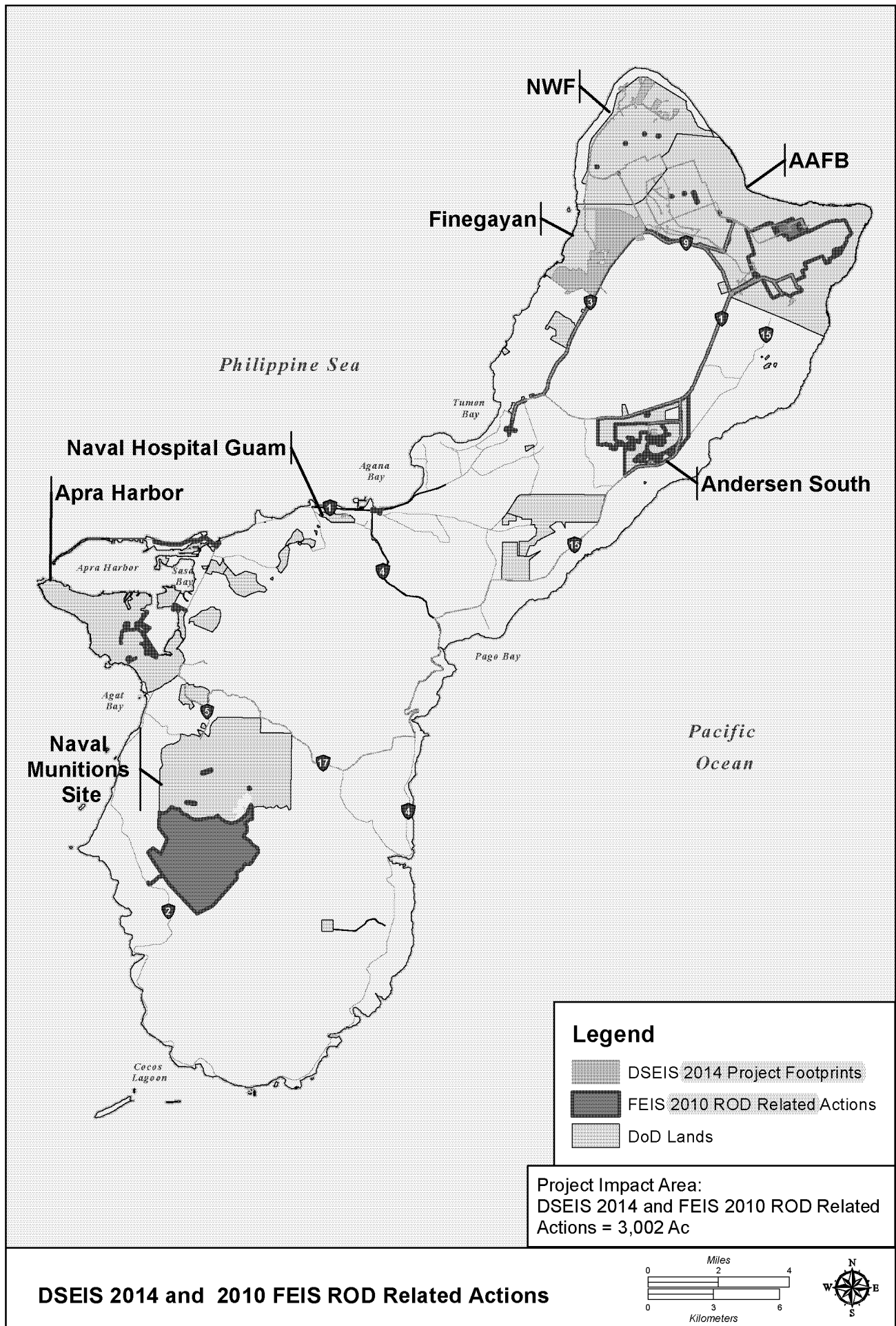
Location	Action (Status)	Disturbed Areas (acres)
Finegayan 	Utilities and Site Improvements (U&SI), Phase I	Approx. 640 acres of clearing/grading
Finegayan	Utilities and Site Improvements (U&SI), Phase II	Approx. 176 acres of clearing/grading
Finegayan	Family Housing	Approx. 315 acres of clearing/grading
Northwest Field (NWF)	Live-Fire Training Range Complex - KD ranges	Approx. 255 acres of clearing/grading
NWF	Live-Fire Training Range Complex - MPMG range	Approx. xx acres of clearing/grading
Andersen South	Hand Grenade Range	Approx. 23 acres of clearing/grading
Finegayan, other existing bases, NWF, and Andersen South	Information Technology/Communications	Approx. 385 acres of clearing/grading
AAFB	Well Field and Associated AAFB Distribution System	Approx. 90 acres of clearing
Finegayan and NWF	Off-Base Utilities (Water, Sewer and Electrical)	Approx. 110 acres of clearing


Figure 2-1.



Key Differences Between 2010 Final EIS and 2014 Draft SEIS		
2010 Final EIS		2014 Draft SEIS
Approximately 8,000 Marines and 9,000 dependents relocating over 5 years	Relocated Population	Approximately 5,000 Marines and 1,300 dependents relocating over 12 years
7-year intense construction boom followed by sharp decline	Construction Period	13-years of moderate construction activity with gradual phase out
More than 79,000 new Guam residents at peak	Peak Population Increase	Less than 10,000 new Guam residents at peak
More than 31,900 additional Guam residents	Steady State Population Increase	Approximately 7,400 additional Guam residents
2,580 acres at Fingoyan preferred alternative	Project Area Commitment	1,451 acres at Fingoyan preferred alternative
Federal acquisition of 688 acres at Fingoyan preferred alternative	Land Acquisitions Commitment	No land acquisition at Fingoyan preferred alternative
5,539 acres for Route 15 preferred alternative (4,439 acres in SOZs, mostly over ocean)	Project Area LFTAC	3,966 acres for Northwest Field preferred alternative (3,331 acres in SOZs, mostly over ocean)
Federal acquisition of more than 1,000 acres at Route 15 preferred alternative	Land Acquisitions LFTAC	No land acquisition at Northwest Field preferred alternative
4 alternative sites in EIS analysis, all in same vicinity	EIS Alternatives Commitment	4 alternative sites in 3 different areas on Guam
2 alternative sites in EIS analysis, both in same vicinity	EIS Alternatives LFTAC	5 alternative sites in 3 different areas on Guam

The Proposed Action in this BA includes those decisions that were made in the September 2010 ROD that remain unaffected by the changes in force structure resulting from the April 2012 Roadmap adjustments and the Proposed Action as described in the 2014 draft SEIS (Figure 2-2).



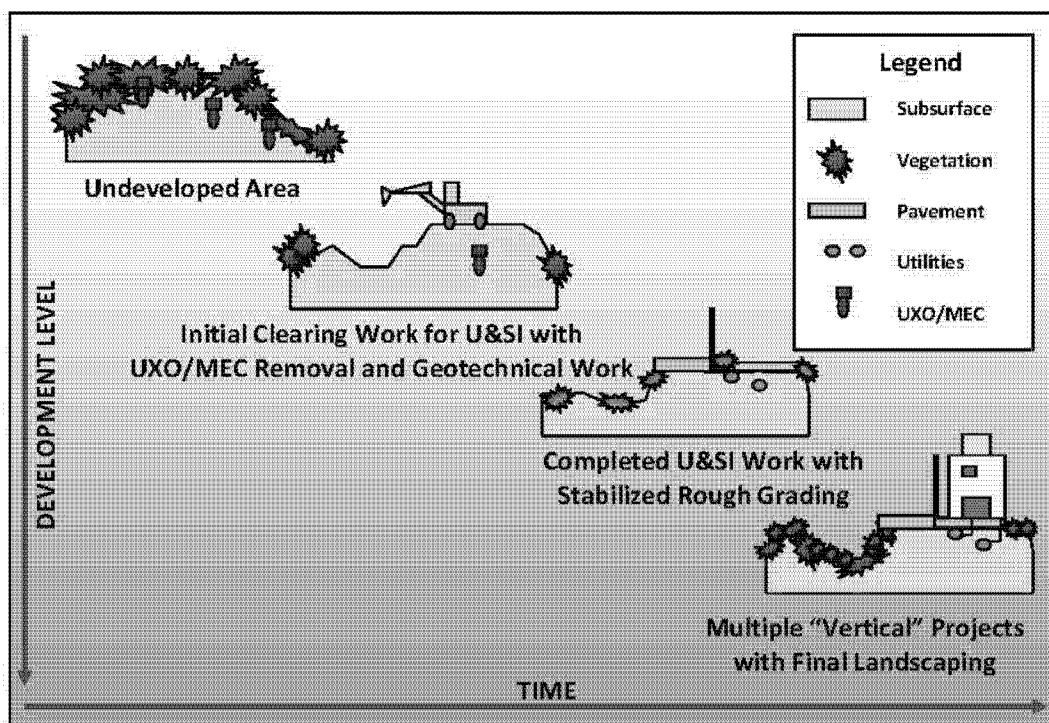
The purpose of this BA is to analyze the potential impacts of  federally listed threatened and endangered species under the jurisdiction of the USFWS from those actions which remain final under the 2010 ROD or are part of the Proposed Action defined in the 2014 draft SEIS.

2.2 MILITARY RELOCATION CONSTRUCTION PROJECTS

Implementation of the Proposed Action includes over 130 separate construction projects. The projects include both horizontal (vegetation clearing) construction and vertical construction. In some instances, the horizontal construction will happen well in advance of the vertical construction.

The limits of a development area, particularly the Main Cantonment, will coincide with the footprint of horizontal construction work referred to as “Utilities and Site Improvements” (U&SI). Virtually all vegetation clearing and the bulk of ground disturbance are performed during preparatory horizontal construction work (includes initial “intrusive” design activities and clearing of unexploded ordnance and munitions and explosives of concern (UXO/MEC)). The Main Cantonment U&SI, as its name implies, basically provides the foundational or backbone transportation, utility and ground surface improvements to prepare the area for future vertical construction and tie-in of individual facilities and utilities. Figure 2-3 generally illustrates the sequencing of a Main Cantonment U&SI project in relation to subsequent development associated with vertical construction.


Figure 2. Phasing of Horizontal/U&SI and Vertical Work for Large Development Areas



2.2.1 Utilities and Site Improvements (U&SI)

There are two U&SI projects (Phases 1 and 2) within subdivided areas, both of which would remove large areas of vegetation, clear the area of UXO/MEC for explosives safety, complete topographic surveys for final cut and fill calculations, and drill/bore for geotechnical studies to confirm the suitability of the underlying soils and bedrock. The U&SI project scope typically includes on-base roadway systems,



utilities (wastewater, water, electrical, telecommunications, etc.), preparatory grading of flat spaces for future building construction and general site drainage. The proposed Phase 1 and 2 areas would occur entirely within the footprint which includes perimeter or boundary areas of Finegayan and existing **rights-of-way** along Route 3 (Figures 2-4 and 2-5). 

A wastewater collection system including a wastewater pump (lift) station and manholes spaced as required would be installed. The new wastewater collection system would be installed underground with a minimum 3.0 feet cover to approximately 5.0 feet deep, or sometimes deeper if needed. The width of the installation trench would be approximately 2.0 feet to 3.0 feet wide. Larger excavations would be required for the installation of manholes.

Potable water demand will be addressed by additional supply from the proposed AAFB Well Field. The current water system serving existing facilities in Finegayan would generally remain in service, but would be modified accordingly to provide for system-wide functionality. Interconnections between the proposed water system and the existing water system would be provided for redundancy and operational efficiency. Depth of excavations will be similar in nature to the wastewater collection system.

The same work to establish interconnectivity to and use of existing utility infrastructure will apply to power transmission and telecommunications infrastructure, and will also require new equipment, overhead lines, substations and standby power generation. Trench excavations required for all utilities will be similar in depth to wastewater and water lines, but may need adjustments based on conflicts or separation requirements.

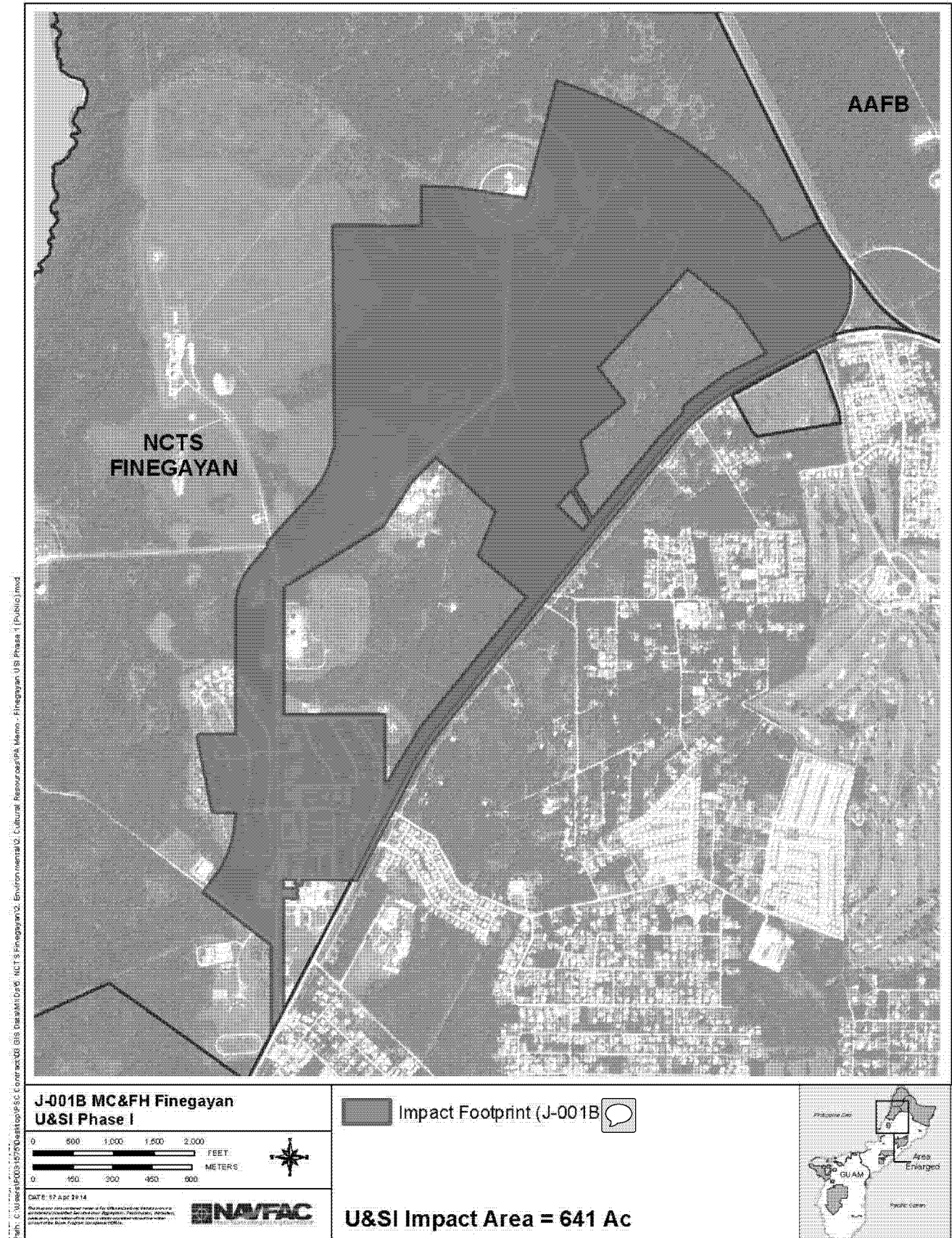
Site Preparation

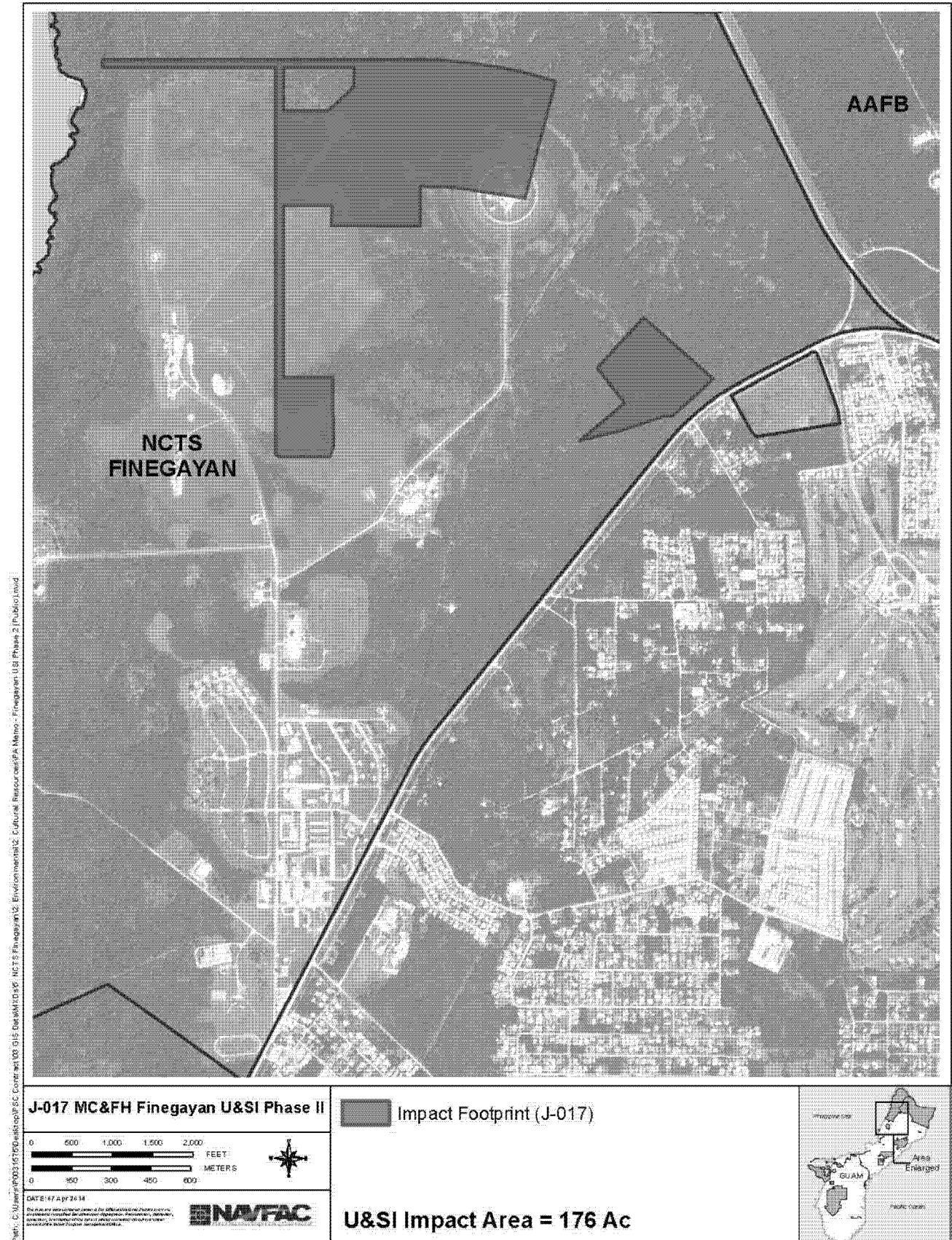
Clearing and Grubbing: The U&SI Phase I area covers approximately 1,633,000 square meters (402.7 acres or 163 hectares) of land requiring clearing and grubbing including removal of vegetation, stripping limestone rock, and removal and stockpiling of reusable topsoil. This site work preparation will occur prior to mass grading the site.

Grading and Earthwork: The U&SI Phase I includes major earth moving (mass grading) and limited fine grading along the roadway corridors and drainage systems. The cut and fill quantities associated with this mass grading effort assume a rough building pad for future vertical construction, which anticipates further import of structural fill. The cut and fill quantities also assume a 0.6 meter deep typical road pavement section including compacted base and pavement surfacing. Existing surface grades (based on LIDAR topo) at tie in points along the Phase I boundary, and along existing communication lines and wellheads are preserved to ensure the plan is implementable. Grading for clear zone at perimeter security fence is included.

The cut and fill quantities are based on the assumption that native material excavated on site is suitable for reuse as fill material. If soil testing and/or geotechnical recommendations indicate otherwise, additional costs and changes in grading may be decreased. Likewise, completion of a topographic survey may change the cut and fill quantities.

Green Waste Facility: Green waste processing and construction recycling would be accomplished by the contractor on site in the northeast corner of the main cantonment area by the construction gate during U&SI Phase I. The processed green waste would be utilized as needed or stockpiled for future use on site as mulch and or a top soil additive to reduce quantity of soil importation.





Fencing

Perimeter Fence: A 8,434-meter long security fence will be constructed around the main cantonment and family housing perimeter. A section of security fence from the tactical vehicle/commercial gate northwest to the cliff line will not be installed in Phase I. A 4.6-meter-wide gravel perimeter road will be constructed on the inside of the fence line, and a 6-meter clear zone will be provided on the outside of the fence line. Conduit for closed circuit television will be provided along the perimeter security fence. The actual closed circuit television will be provided by others.

Electrical Utilities

Electrical Substation: A 418 square meter main substation equipped with two 15 MVA, 34.5 kV – 13.8 kV transformers, using double-ended configuration will be constructed in the main cantonment area, south of the main gate. Provisions will be made in the substation for primary line connections to the planned 34.5 kV underground line from the Harmon Substation and to the planned 34.5 kV line from AAFB. This project will fund the connection of the main substation to the planned line originating from the AAFB Substation and the planned underground line originating from the Harmon Substation. Switchgear space for future circuit breakers and empty conduit runs for future connections to the main substation are being provided. This space is to accommodate future connections that may be necessary to support and integrate the existing 13.8 kV critical circuits and existing 4.16 kV non-critical load at NCTS.

Mechanical Utilities

Water Distribution: A new transmission main, to be installed by other projects, will convey water from the well field storage tank at AAFB to the boundary of the main cantonment area near the commercial/tactical vehicle gate. This project will construct a 600-mm diameter pipe 1,065 meters long from Route 3A, near the commercial/tactical vehicle gate, to the new and included 5.7-million liter ground level water storage tank and pump/treatment facilities. The 5.7-million liter ground tank will include internal compartments to facilitate maintenance. The existing main between Well No. 6, 7, 11, and 12 will be demolished and realigned to the proposed roadways being constructed in Phase I. The existing 6-inch and 8-inch distribution mains servicing the abandoned Building 200 will also be removed within the Phase I grading limits. In the short term (interim conditions), the existing NCTS water wells will provide the Marine Corps system with water. The long-term plan will provide the Marine Corps water distribution system with water from both the existing NCTS wells and the AAFB system. This will provide an emergency backup for the water supply should the source/transmission system from AAFB be taken off line for maintenance or other reasons.

Sanitary Sewer: The existing DoD wastewater collection system within the main cantonment area at the Finegayan site consists of a trunk sewer serving Building 200 and connected to the GWA wastewater collection system through a GWA interceptor sewer along Route 3. Wastewater is conveyed to the Northern District Wastewater Treatment Plant (NDWWTP). Capacity evaluations of the existing collection system indicate the GWA interceptor sewer has adequate capacity for the proposed action. With the issuance of a revised NPDES permit in 2013, the NDWWTP currently cannot meet the new secondary treatment discharge limits. The estimated total increase in wastewater flow from the main cantonment area throughout the entire Marine Corps construction program is within the design capacity of the NDWWTP; however, the plant is currently out of compliance with the revised NPDES permit. The implementation timeline for planning, designing, constructing, and bringing operational the required secondary treatment system to meet the new discharge requirements of the revised permit requires negotiations between the GWA and U.S. EPA. The notional grading for the main cantonment area generally slopes downhill from north to south. The U&SI Phase I sewer system would consist of 5,940

meters of sanitary sewer lines installed within Phase I Roads (see attached sewer collection sketch – Phase I area), along with 62 manholes, two WWPSs, and 900 meters of force main. A connection to the existing GWA inceptor sewer main along Route 3 is included.

2.2.2 Main Cantonment [~1110 acres]

The two U&SI projects (Phases 1 and 2) mentioned above would remove large areas of vegetation, clear the area of UXO/MEC for explosives safety, complete topographic surveys for final cut and fill calculations, and drill/bore for geotechnical studies to confirm the suitability of the underlying soils and bedrock. The limits of a Main Cantonment development coincide with the footprint of horizontal construction work referred to as “Utilities and Site Improvements” (U&SI). Virtually all vegetation clearing and the bulk of ground disturbance are performed during preparatory horizontal construction work (includes initial “intrusive” design activities and clearing of unexploded ordnance and munitions and explosives of concern (UXO/MEC).

The proposed Main Cantonment development includes essential base operations and support facilities and functions that are divided into the functional categories listed below, followed by examples of buildings/facilities for each:

1. *Command Core - Marine Expeditionary Brigade Headquarters (MEB HQ) and Command Buildings*
2. *Unit Operations – 3rd MEB Command Element (CE), 4th Marines, Ground Combat Element Infantry Battalion 1 and 2 (GCE – Inf Bn#1/2), Artillery Battery, Combat Logistics Battalion[CLB]-4, 9th Engineer Support Battalion (ESB) and Explosive Ordnance Disposal (EOD)*
3. *Base Operations – Base Administration, Fire Station, Public Works, Vehicle Fueling, Base Auto Shop, Kennel, Corrosion Prevention and Control (CPAC), Security, etc.*
4. *Bachelor Enlisted Quarters and Bachelor Officer Quarters (BEQs/BOQs)*
5. *Community Support – Dining Facility, Fitness Center, Recreation Areas, Education Center, Auditorium/Theater, Branch Exchange, Bank/Credit Union, Food Court/Amusement Center, Medical/Dental Clinic, Post Office, etc.*
6. *Training – Battle Training Center, Individual Combat Skills Course, etc.* These categories of cantonment functions are generally consistent with those previously described in the proposed action for the 2010 FEIS Volume 2 Chapter 2.2; however, the relative size of the required cantonment area is considerably reduced given the smaller size and adjusted composition of the relocating force (i.e. a reduction from the original plan for approximately 8,600 Marines and 9,000 dependents to a force of approximately 5,000 Marines and 1,300 dependents). The Preferred Alternative in the 2010 ROD is almost 78% larger in terms of lands proposed for development than the Proposed Action addressed in this BA. It is expected that many facilities will be sized proportionately smaller based on the reduced number of personnel and the facility footprint requirements.

Unit Operations and Base Operations will have the most intensive land use, equivalent or similar to activities found in light industrial zoned areas. Activities in the Command Core, BEQ/BOQ, Community Support and Training functions will have activities that are equivalent to residential or commercial zoned areas.

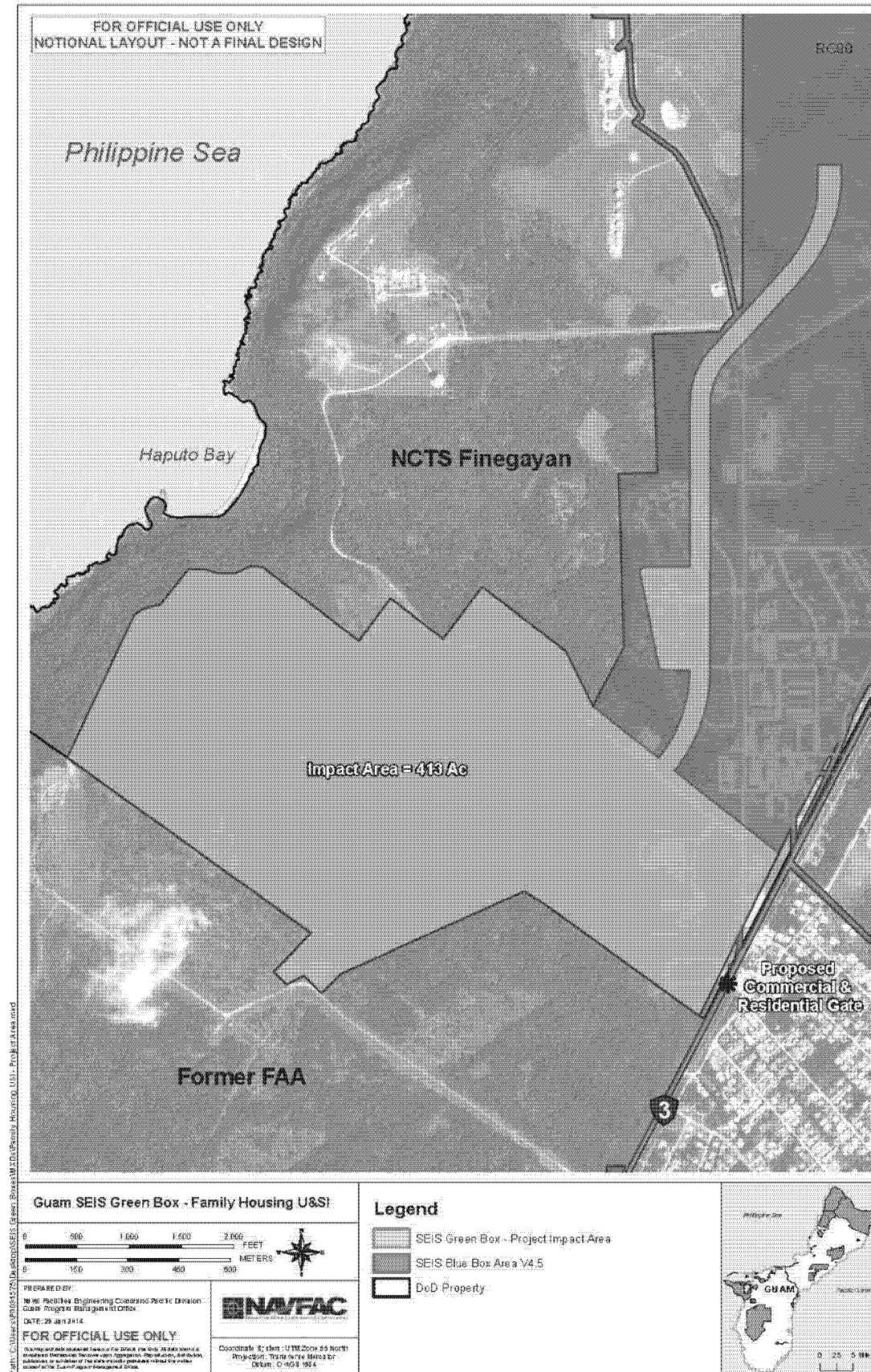
Individual projects for follow-on vertical work (buildings and structures) will be implemented in accordance with function-specific criteria pertaining to civil, architectural, structural, mechanical, electrical and other engineered features of work.

2.2.3 Family Housing [~315 acres]

The proposed Family Housing development area within the contiguous Finegayan area depicted in Figure 2-6 includes residences for “accompanied” permanent (referred to as Permanent Change of Station or PCS) Marines and their dependents and family-oriented support and recreational facilities. Unaccompanied Marines (usually “rotational” or part of the Unit Deployment Program or UDP) would stay at the Main Cantonment BEQs/BOQs for during their shorter-term (approximately 6 months) assignment to Guam.

The Family Housing development category is subdivided into the proposed 535 Family Housing Units, a Community Center, Family Services Center, Elementary School, Child Development Center, Temporary Lodging Facility, Youth Center and a Location Exchange (Mini-Mart). As discussed previously, these functions are consistent with the 2010 FEIS, but are appropriately reduced in scale given the smaller number of PCS Marines accompanied by dependents. Although physically contiguous with the proposed Main Cantonment at Finegayan, the “limits of development” shown in Figure 2-6 depicts the boundary of the proposed Family Housing construction activities. The construction phasing plan for Family Housing proposes to perform one (1) Family Housing U&SI phase early in the program sequence, but after the Main Cantonment U&SI phases. Follow-on vertical construction for the individual support facilities (both residential and non-residential units) would proceed subsequent to the Family Housing U&SI project. Development of follow-on Quality-of-Life (QOL) facilities constructed for the housing development will be sequenced similar to other vertical work.

Similar to the Main Cantonment, the Family Housing development area will require construction and operation of electrical, wastewater, water and telecommunications utilities to address new demands. Power and telecommunications would be provided to the Family Housing area through new on-base lines connected to the new Main Cantonment systems. Wastewater collection demand would be met by two sewer pump stations and associated sewer lines and manholes to convey flows off-base to the existing Guam Waterworks Authority (GWA) collection system. The potable water demand for the housing area would be provided by the existing production wells in Finegayan with reconfiguration of existing on-base water distribution mains.



2.2.4 Live-Fire Training Range Complex [~255 acres]

The proposed LFTRC development area at AAFB NWF includes construction and operation of live-fire training ranges and associated range operation and control facilities to meet the individual weapons training/qualification requirements of the Marine Corps force. The limits of development for the LFTRC are depicted in Figure 2-7.

The proposed LFTRC would include a Known Distance (KD) Rifle Range, KD Pistol Range, Non-standard Small Arms (NSSA) Range, Modified Record of Fire (MRF) Range, repairs to Route 3A, and a MPMG Range. A more detailed description of the ranges, including the approximate footprint of each range, is fully described in the DSEIS Section 2.2.3.

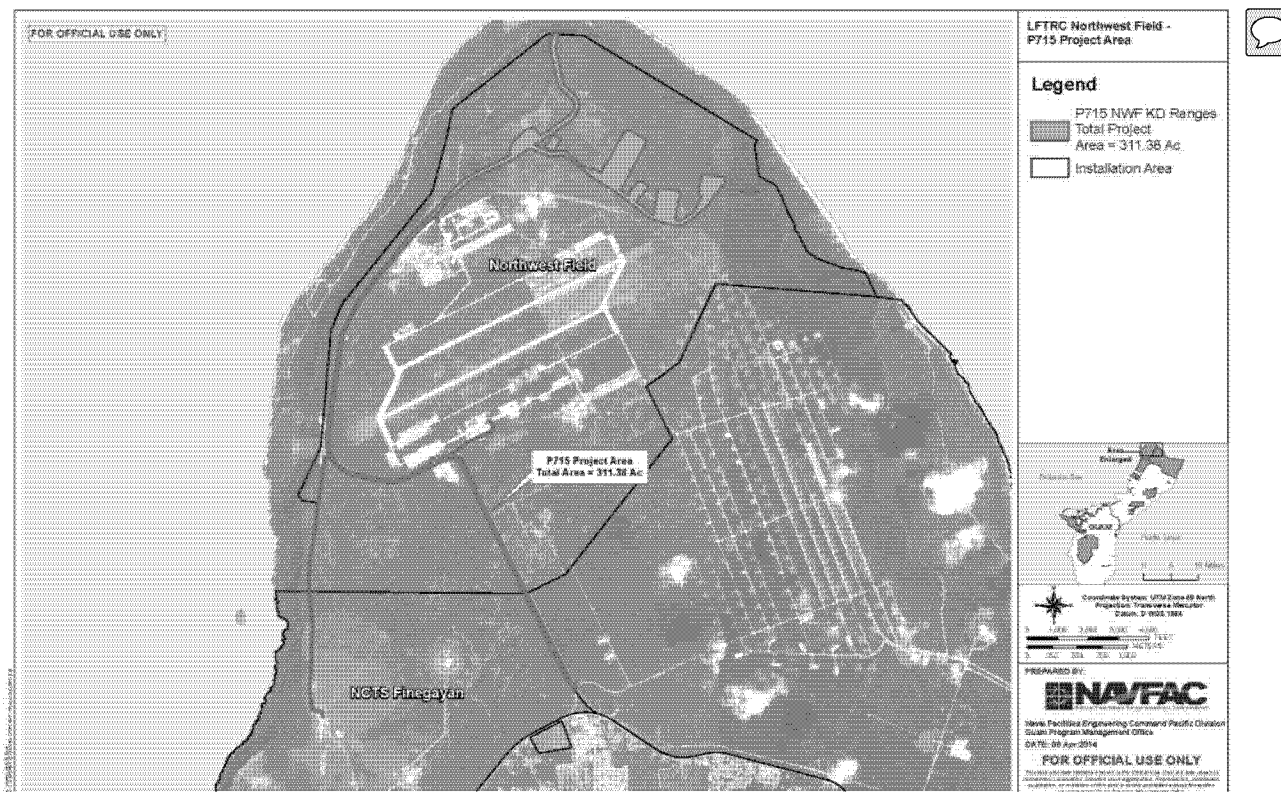
Development of the LFTRC is anticipated to occur in two phases that would construct the MPMG Range under one phase and the rest of the smaller ranges and Route 3A would be grouped under another phase.

The proposed LFTRC development would also include three range observation towers, target storage and maintenance shed, ready issue ammunition magazine, covered bleachers, portable toilets, perimeter fencing, safety signage, and parking. Range footprints would be entirely cleared of vegetation and the range would be designed so that virtually all expended rounds of ammunition would be contained by berms within the footprint.

Following construction, some non-native grassy vegetation may be introduced for erosion and storm water control in some areas of the range footprint in keeping with the DON's landscaping guidelines. The LFTRC would also require construction of new electrical, telecommunication, wastewater and water lines and/or facilities configured to operate with the existing utility infrastructure of AAFB NWF.

The LFTRC (as well as the Hand Grenade (HG) Range in the next subsection) would be managed in accordance with current Marine Corps range management policies and procedures, which are designed to ensure the safe, efficient, effective, and environmentally sustainable use of the range area. A thorough explanation of range management measures that remain inherent to the Proposed Action can be found in the 2010 FEIS (Volume 2, Chapter 2, Section 2.3.1.4). Examples of measures that remain applicable in the DSEIS include a Range Safety Program, range maintenance, event scheduling, access control, fire management, and environmental protection and monitoring activities.

In addition to the physical range footprint, an imaginary SDZ would delineate areas that contain a less than 1 in 1,000,000 probability area wherein fired ammunition fragments or ricochet may land, forming the outermost limit of a LFTRC. No construction or vegetation clearing will occur in the SDZ. The LFTRC is an "open" range that does not include design elements such as overhead baffles to contain rounds beyond the traditional "backstop" berms. The SDZ projects north and outward over lands under USFWS control and onto federal submerged lands. The DON would demarcate the SDZ beyond the shoreline through navigation map updates and potentially with marker buoys (if required as part of designation or regulatory approval) anchored to the ocean bottom to alert maritime traffic of the potential hazard. For the landbased perimeter of the SDZ, perimeter fencing and/or signage would indicate its boundaries for personnel and public safety.

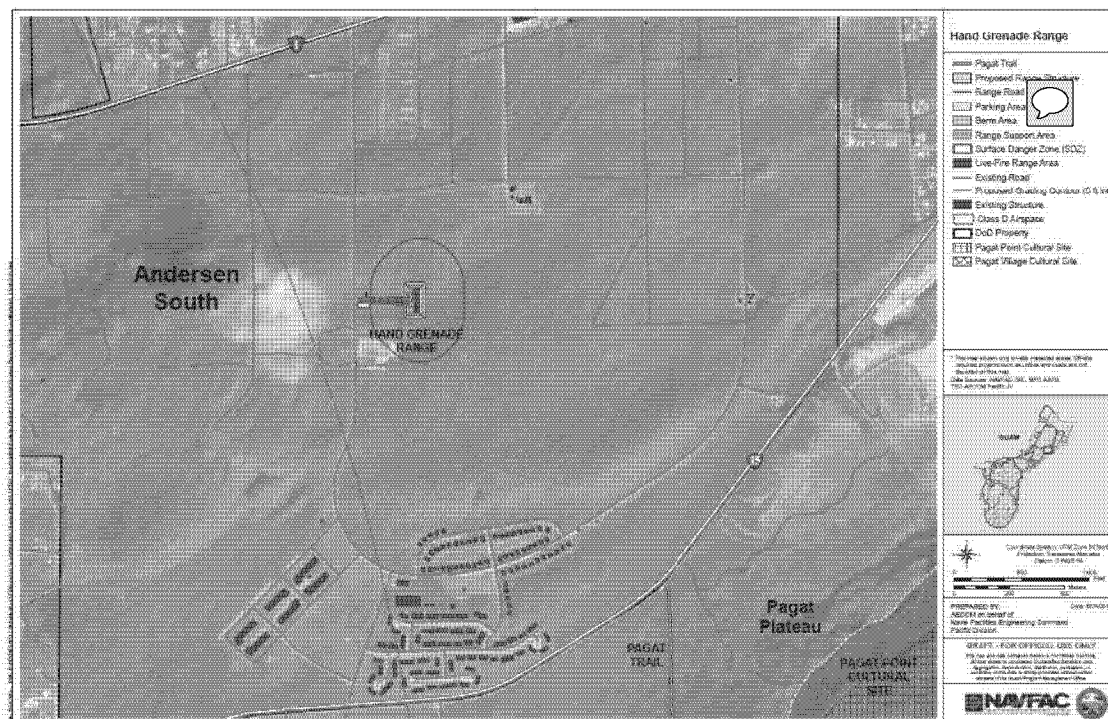


2.2.5 Hand Grenade Range [~23 acres]

In addition to the small arms training ranges collocated within the proposed LFTRC, the Proposed Action also includes a development area for a separate HG Range at Andersen South, depicted in Figure 2-8. The proposed HG Range would include an approximately 0.9 acre area developed as a hand grenade training complex for the M67 fragmentation grenade and will be connected to existing utility infrastructure where available.

The following features would be developed within the hazard zone: a holding shelter for four persons, four throwing positions with grenade sumps, a range observation tower with ballistic glass, and a grenade “duded” impact area. A grenade house would be collocated with the grenade throwing pits. There would also be a concrete munitions storage (i.e., magazine) surrounded on three sides by earthen berms for the temporary storage of hand grenades during training events. In addition to the live-fire area, there would be a 1.0-acre non-live-fire training area developed adjacent to the range and outside of the SDZ. The training area would consist of a demonstration area with bleachers, an open practice throwing field with various targets and throwing positions, portable toilets, and a parking area. Inert practice grenades would be used at this training area to provide familiarization training prior to proceeding onto the live-fire area of the range.

Figure 6. Hand Grenade Range Development Area (See Also DSEIS Figure 2.4-7)



2.2.6 Information Technology/Communications [~385 acres]

The proposed Information Technology/Communications (IT/Comm) development area would require inter-base connections between the proposed Marine Corps main cantonment area and other existing bases, the proposed LFTRC, and 2010 ROD-covered training facilities at Andersen South. These hardwired connections would consist of up to six 4-inch conduits buried approximately 3.0 feet deep. Off-site conduits would be encased in concrete and would have lockable manholes for security. Because redundant off-island communication paths are needed, an additional connection to the Tata Communications cable termination facility from AAFB may be required. Off-site conduits would follow existing roads and rights-of-way between the facilities, as shown in Figures 2- 9 thru 2-12, and could reasonably occur within an area approximately 385 acres within or adjacent to previously-developed transportation routes (the actual disturbance footprint of the linear construction work would be much less). The completed utilities would not normally be visible after restoration of the disturbed ground to original or better condition as these would be primarily underground.

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NOTIONAL LAYOUT - NOT A FINAL DESIGN

Guam SEBS Proposed Off Base Communication Lines Impacted Area

MCFH Finegayan/Finegayan and Finegayan/South Finegayan & LFTRC Northwest Field

Legend

- Impacted Areas (35A-20)
- Main Cantonment, Family Housing and LFTRC Alternatives
- Highway
- DOD Property

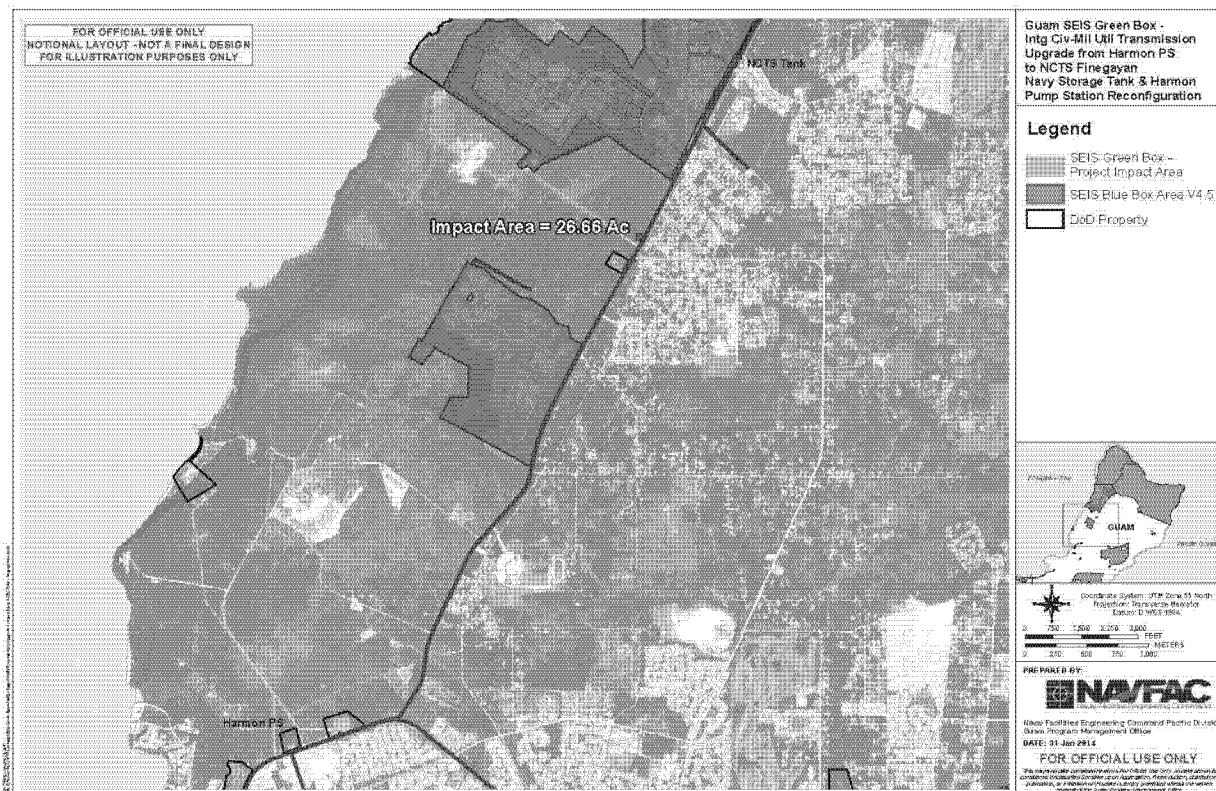
* Impacted Areas Includes Off-Base Communication Utilities.

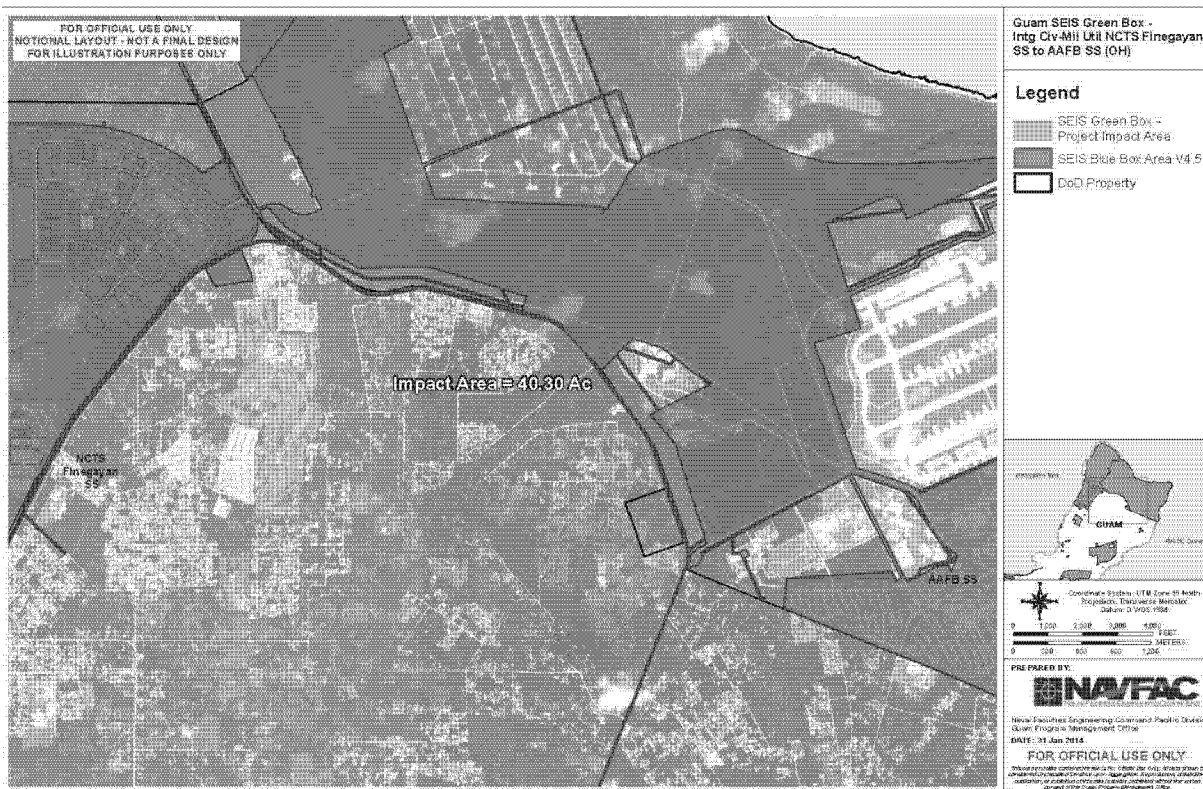
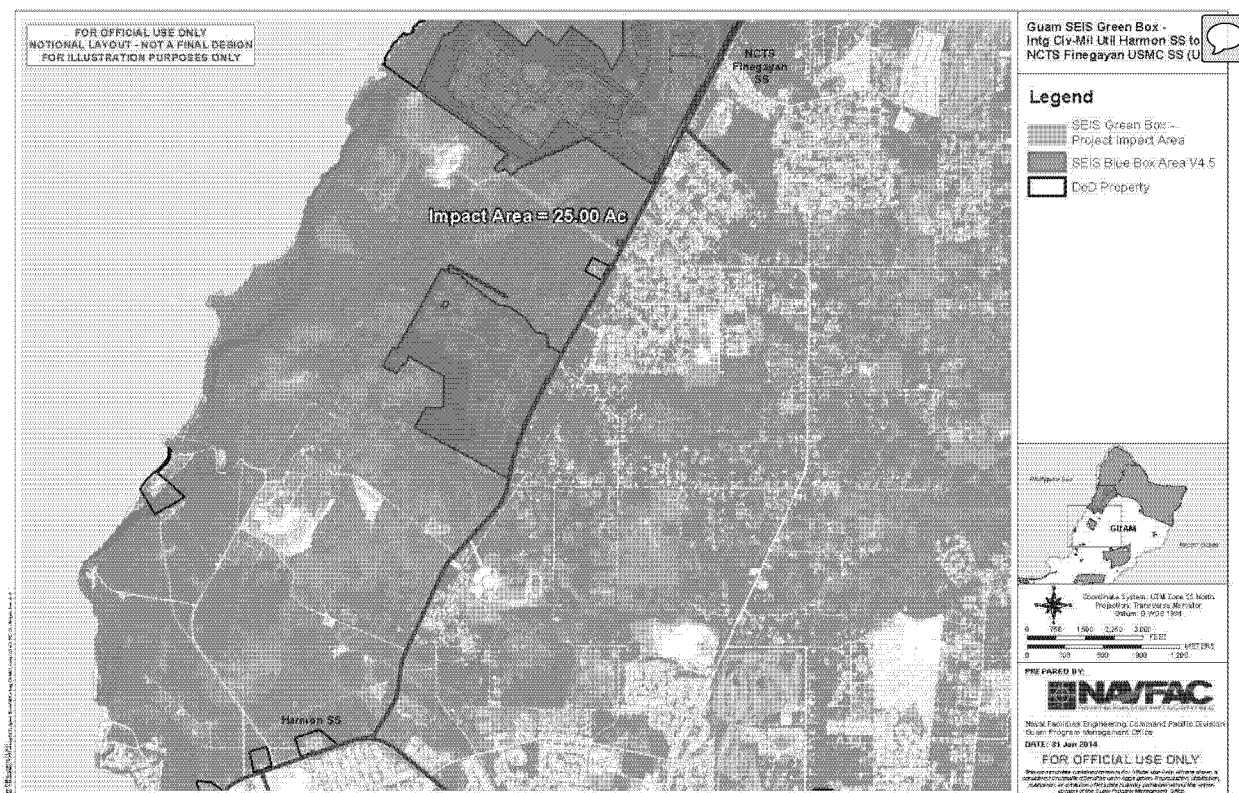
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DATE: 24 JUN 2013

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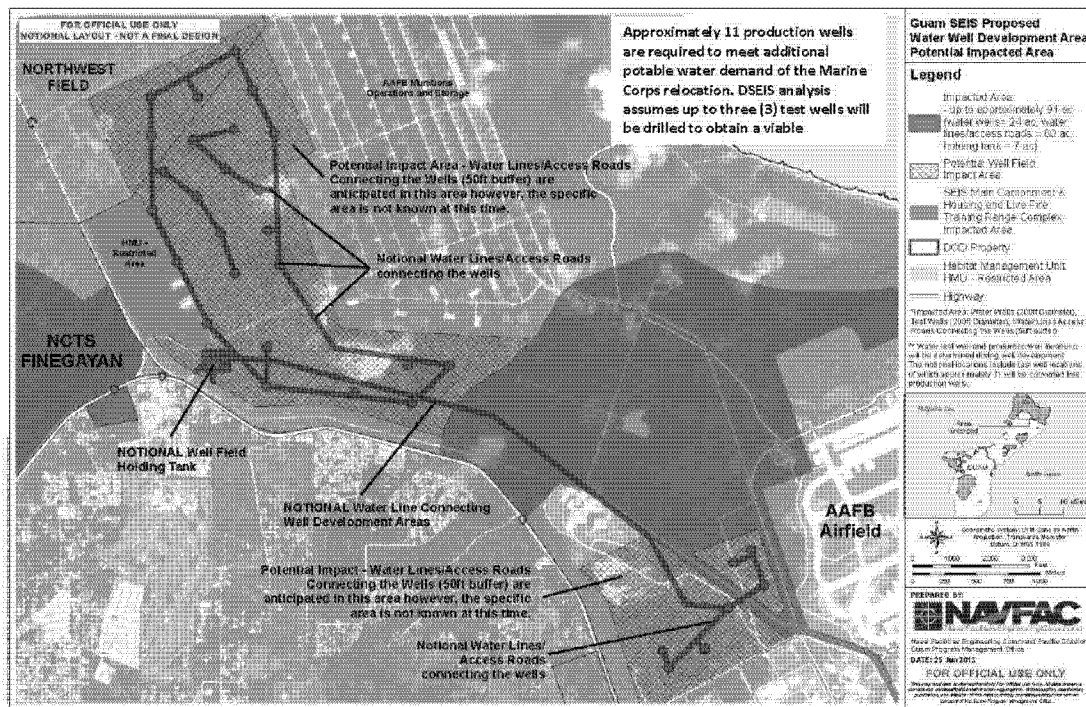


2.2.7 AAFB Well Field and Associated AAFB Distribution System [~90 acres]

Increased water supply for the main cantonment area would come from the proposed AAFB Well Field and refurbished wells. The proposed development area would accommodate the construction of approximately 11 new product wells and is depicted in Figure 2-13 with impacts to approximately 90 acres. Note that the actual footprint of the final production wells and the access roads to each is not known at this time, but it would occur within the well field limits as shown. Based on conservative estimates, it is anticipated that to locate one well of sufficient yield to support production approximately three test wells would be required.

The new potable water production wells would feed a new well field collection tank, pump and water treatment facility (chlorination and fluoridation) all proposed within AAFB. The main cantonment area would be provided with a new ground level water storage tank supplied by the new well field storage tank. This system would also be connected to the northern water transmission loop through an off-base waterline. A water pump station with an emergency generator would be utilized. The new potable water distribution pipes would be installed underground with a minimum of 5.0 feet deep. The width of the trench to install the pipes would be about 1.0 foot to 3.0 feet.

Figure 10. New AAFB Well Field Development Area (See Also DSEIS Figure 2.3-12)



2.2.8 Off-Site Utilities (Water, Sewer and Electrical) [~110 acres]

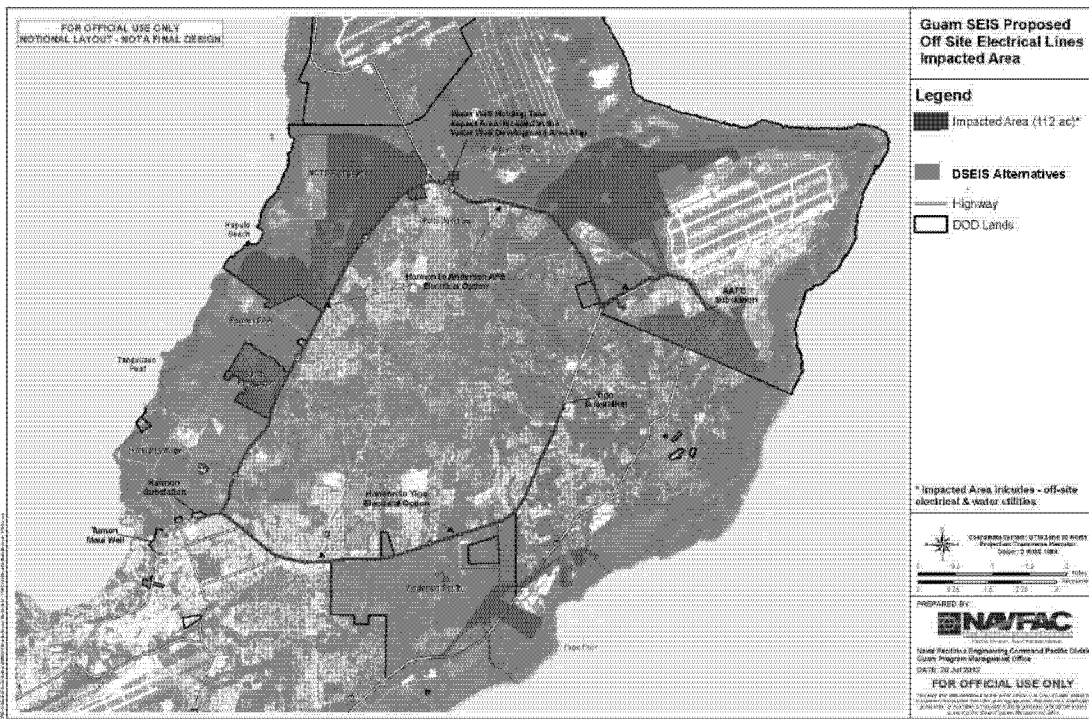
The Proposed Action will require a development area for off-base water and electrical utilities to support the Main Cantonment, Family Housing and LFTRC activities. Although the linear construction occurring alongside roadways would be limited to narrow areas of trenching and excavation for installation of utilities along the affected alignment, a 50-foot was included to conservatively capture potential disturbance. The extent of the proposed area of development in Figure 2-14 is approximately 110 acres,

inclusive of the disturbance buffers. The Off-Base Utilities development area would upgrade existing 34.5 kilovolts electrical lines, either the Harmon Substation to the Yigo Substation.

The off-base water distribution system will convey water produced at the New AAFB Well Field to the Main Cantonment and Family Housing Area through Route 3 and will have the ability to connect to DoD's goal of a northern water transmission loop to enable a fully-integrated water system serving DoD and GovGuam customers.

This future integration (independent of Marine Corps relocation) will have the necessary redundancy and enhanced capabilities for water exchanges between the DON and GWA systems in times of disaster recovery or other contingency operations.

Figure 11. Off-Base Utilities Development Area (See Also DSEIS Figure 2.3-12)



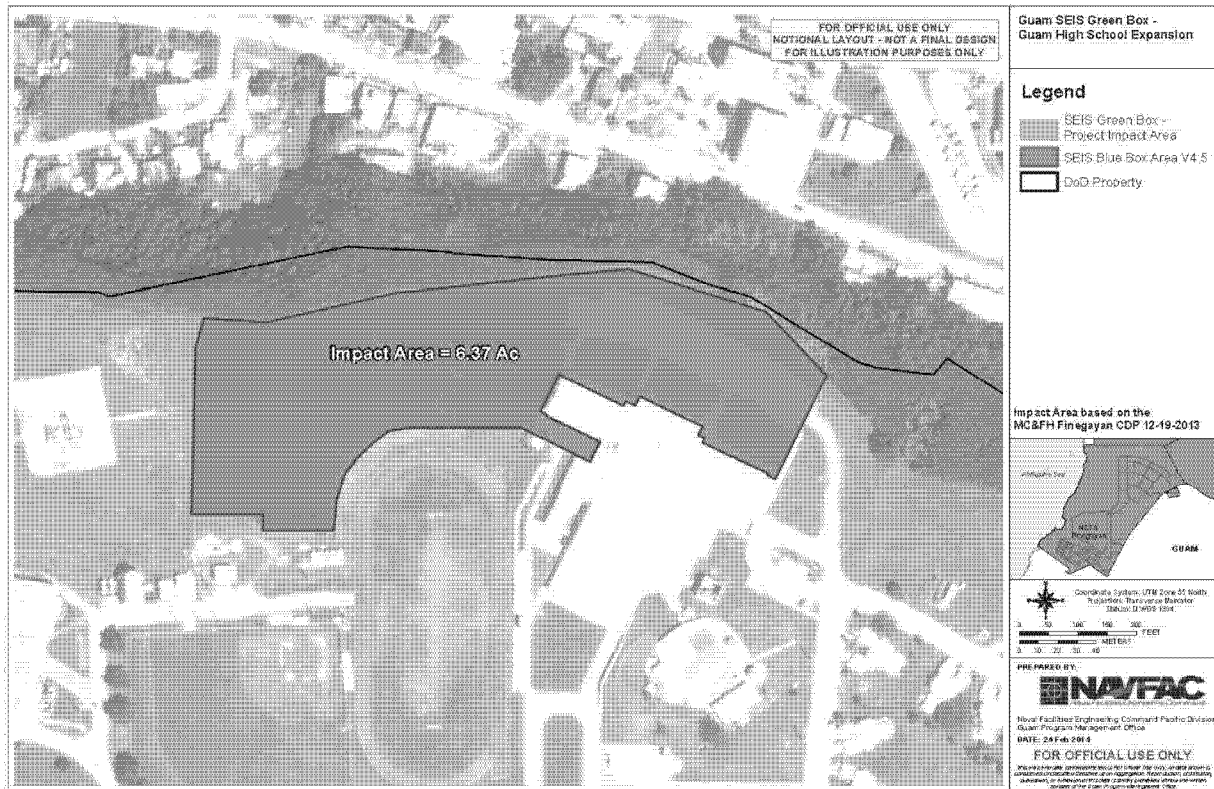
2.2.9 Guam High School Expansion [6 acres]

The proposed Guam High School development area located at the Naval Hospital site in central Guam would expand the existing facility to accommodate additional students associated with the Marine Corps relocation. The existing school is a two-story, 116,174 square foot facility designed to accommodate approximately 500 students.

The negative determination submitted by the Navy to Guam Bureau of Statistics and Plans (subsequently concurred upon 17 Aug 2004) as part of the 2004 Final EA for the Guam High School and McCool Elementary/Middle School included open space to allow extensions to the existing high school classroom buildings to a maximum capacity of 650 students. The proposed expansion is within the parameters of Guam Bureau of Statistics and Plans's prior concurrence and will be supported by existing infrastructure. The limit of disturbance within the existing open space is depicted in Figure 2-15.

The additions to the existing building will increase available space by approximately 25,500 square feet and would typically include construction activities such as geotechnical studies for design, site grading, utility excavation, drainage and footing preparation, and construction of building-associated structures

(e.g. foundations, walls, columns, roof systems, etc.). The completed work will also include indoor/outdoor lighting, air conditioning, fire protection, telecommunication, space furnishings, final landscaping, and other appurtenances and features to ensure a fully-functional and usable educational facility.



2.2.10 2010 ROD Projects Development Areas [~370 acres]

The 2010 ROD-Related Actions that were not affected or remain unchanged by the 2012 Roadmap Adjustments SEIS are discussed in detail in the 2010 FEIS (Volume 1, Chapter 2: Overview of Proposed Actions and Alternatives, Section 2.2: Marine Corps Relocation – Guam, pages 2-7 through 2-17), and are summarized in Table 2-2 (adapted from DSEIS Table 6.2.1-1) and depicted in Figure 2-16. The proposed carrier berthing and the Army Missile Defense Task Force assignment to Guam are not included as part of the Proposed Action and have an independent disposition from the Marine Corps relocation.

Table 2-2. Description of 2010 ROD Project Development Areas


Location	Action (Status)	Description	Disturbed Areas (acres)
AAFB	Location for the Marine Corps Air Combat Element and construction of associated facilities at AAFB North Ramp (Parking Apron and Utilities Under Construction)	Will accommodate helicopter and other vertical lift aviation assets, operations, hot fueling operations, maintenance, munitions storage and related training and support functions.	Approx. 69.0 acres of clearing/grading
AAFB	Construction of air embarkation facilities at AAFB South Ramp (Air Freight Terminal Complex Under Construction)	Will include the Air Mobility Campus, Organic Marine Corps Cargo, Air Freight Terminal Complex, Passenger Terminal and operations.	Approx. 28.0 acres of clearing
AAFB	Construction of the North Gate and access road at AAFB, including a new Entry Control Point facility (Under Construction)	Will improve traffic flow and physical security of vehicles entering and exiting the air base.	Approx. 2.0 acres of clearing
Andersen South	Development of a training range complex to include maneuver training and landing zones (Under Design)	Will include facilities for Military Operations on Urban Terrain, and maneuver training (e.g. convoy course, simulated villages, etc.), including a Breacher House. Will also include landing zones to support training in Confined Area Landing, External Loads, and Helicopter Insertion/Extraction.	Approx. 160 acres of clearing/grading
Apra Harbor	Waterfront functions at Apra Harbor to support embarkation, including wharf and utility upgrades, and associated berths. (Uniform and Tango Wharf Improvements and Apra Harbor U&SI Under Construction)	Berths and adjacent support structures, utilities and lay-down areas will be upgraded to accommodate increased usage and to meet the new and emerging requirements in support of the Marine Corps relocation. Requirements include embarkation operations, support vessel transport berthing, escort ship berthing, and an amphibious vehicle laydown area.	Approx. 172.2 acres to be upgraded
Apra Harbor	Waterfront functions at Apra Harbor to support embarkation, including wharf and utility upgrades, and associated berths. (Apra Harbor U&SI Completed)		
Apra Harbor	Relocation of Military Working Dog Kennel (Under Construction)	Existing dog kennel and administration spaces will be relocated because noise of embarkation will be incompatible with the existing uses as a military working dog kennel and training location.	Approx. 2.0 acres of clearing/grading
Apra Harbor	Relocation of U.S. Coast Guard (Future Project)	Ship berthing and crew support buildings will be relocated to the former Ship Repair Facility because ships carrying amphibious vessels will require the full length of Victor Wharf.	Approx. 11.0 acres to be upgraded
Apra Harbor	New Medical Clinic (Future Project)	A new medical/dental clinic will accommodate, in part, the increase in on-island military population.	Approx. 7.8 acres will be upgraded
Apra Harbor	Apra Harbor Embark Operations 	This project will construct the following embarkation operations support facilities: 1) Cargo Staging Area, 2) Vehicle and Equipment Ready Fuel Storage, and 3) Vehicle Wash Platform.	TBD
NAVMAG	Access to the NAVMAG area using the existing hiking trail as the access road (No Construction Required)	The existing hiking trail will be used to access NAVMAG. The trail will not be improved and will be used by foot traffic only.	0.0 acres no construction disturbance
Naval Munitions Site or "NAVMAG"	Training activities, including aviation training and nonfiring operations training (Future Project)	Will include maneuver training areas and landing zones to support training in Confined Area Landing, External Loads, and Helicopter Insertion/Extraction.	Approx. 13.6 acres clearing/grading

Table 2-2. Description of 2010 ROD Project Development Areas (continued)


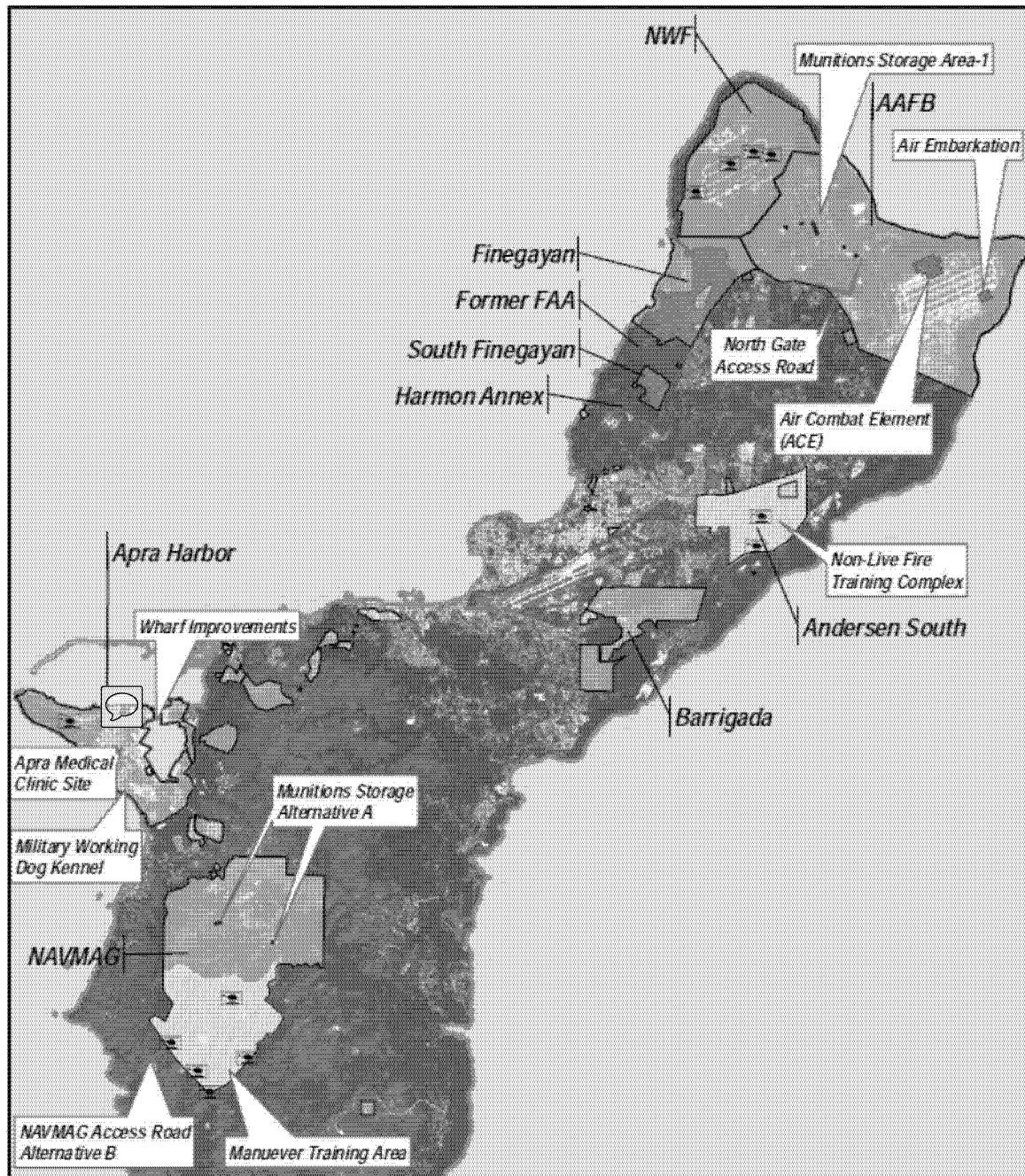
Location	Action (Status)	Description	Disturbed Areas (acres)
NAVMAG	Use of Parsons Road area for the location of additional ammunition storage at NAVMAG (Future Project)	Earth-covered magazines will be located at the existing munitions storage area.	Approx. 8.8 acres clearing/grading
Tumon Maui Well Project	Well Repair project proposes to restore the well facilities back into service to support the immediate water demand from the military build-site.	Site work consists of site grading and drainage, installing pipe support/pads, replacing existing fence and install new fence.	
Roadway Project (by FHWA and Guam Department of Public Works [GDPW])	Route 1 and Route 8 intersection and improvement (Hagåtña) ("Guam Road Network" [GRN]1) – (Part of Hagåtña Bridge Replacement Project Scope, Under Construction)	Intersection improvements (0.24 mile on Route 1 and 0.09 mile on Route 8) to provide two left-turn lanes and two right-turn lanes for northbound Route 8 approaching Route 1	0.0 acre, on developed lands requiring upgrades to existing roadways 
Roadway Project(s)	Route 1 and Route 3 intersection and roadway improvements (Dededo) (GRN2) – (Under Design, Construction On-Hold)	Intersection improvements (0.15 mile on Route 1 and 0.04 mile on Route 3) to provide southbound left, combined left/right, and free right with acceleration lane; east to north double left-turn lane. Road widening could also be included dependent on road width requirements.	0.0 acre, on developed lands requiring upgrades to existing roadways, shoulders and easements
Roadway Project	Replacement of Hagåtña (Agaña) Bridge #1 with reinforced concrete (GRN3) – (Under Construction)	Agaña Bridge replacement.	0.2 acre of affected river banks, with developed lands requiring bridge replacement and upgrades to existing roadways
Roadway Project	Route 11 roadway improvements from the port to Route 1, including pavement strengthening (GRN4) – (Completed)	Pavement strengthening of two lanes.	0.0 acre, on developed lands requiring upgrades to existing roadways
Roadway Project	Widening of the Route 1 and Route 11 intersection, adding a second left turn lane and pavement strengthening (GRN5) – (Completed)	Intersection improvements (0.12 mile on Route 1.	0.0 acre, on developed lands requiring upgrades to existing roadways and unpaved shoulder areas
Utility Project	Rehabilitation and installation of disinfection and treatment water system, water tank, booster pumps, emergency generator, and transmission facilities required to provide potable water supply. (Completed)	Will provide additional potable water capacity in support of the relocation of U.S. Marines from Okinawa to Guam. Includes rehabilitation of the Tumon Maui Well, installation of disinfection water system, chlorination and testing and water transmission system as well as provisions for future connectivity to Guam Waterworks Authority water lines to support Defense Policy Review Initiative (DPRI) construction activities.	0.0 acre, on developed lands requiring upgrades to existing facilities

Figure 12. 2010 ROD Projects Development Area



2.3 BEST MANAGEMENT PRACTICES

The Proposed Action includes the implementation of Best Management Practices (BMPs) to proactively reduce, minimize, or avoid impacts. BMPs are existing policies, practices, and measures required by law, regulation, or DoD policy that reduce the environmental impacts of designated activities, functions, or processes. BMPs are distinguished from mitigation measures because BMPs are:

- (1) existing requirements for the Proposed Action,
- (2) ongoing, regularly occurring practices, and
- (3) routinely applied to the type of construction proposed.

In other words, the BMPs are inherently part of the Proposed Action and are not additional mitigation measures. The BMP's applicable to the BA are listed in Table 2-3.

Table 2-2 Best Management Practices Applicable to this Biological Assessment

BMP	Description	Impacts Reduced/Avoided	Timing
Contractor Education Program	The DON education program to ensure construction contractor personnel are informed of the biological resources in the project area, including special-status species, avoidance measures, and reporting requirements.	Inadvertent impacts to terrestrial biological resources due to lack of awareness of resource presence, sensitivities, and protective measures	Pre-C and C
Contractor Plans and Specifications	All construction will occur within the limits of construction shown in the Contractor Plans and Specifications.	Habitat loss	Pre-C and C
Hazard Analysis and Critical Control Point (HACCP) Plan	Construction contracts will contain a requirement to develop a HACCP Plan which will identify risks and potential pathways for non-native species and will outline procedures for controlling and removing risks identified. Construction contracts will also contain a requirement for inspections and proper re-use or disposal of vegetation to avoid contributing to the further spread of the coconut rhinoceros beetle. This plan will be approved and inspected by the biological monitor.	Inadvertent spread of non-native species on Guam or to other locations off of Guam.	Pre-C and C
Lighting Installation	Lighting will be designed to meet minimum safety, antiterrorism, and force protection requirements. Hooded lights will be used to the maximum extent practicable at all new roads and facilities within sea turtle land habitat and fruit bat habitat. "Night-adapted" lights will be installed in the briefing and bleacher areas. Illumination of forest, coastline or beach will be kept to an absolute minimum.	Avoid and minimize impacts to sea turtles and fruit bats.	Pre-C and C
Pre-Construction Surveys for the Mariana Fruit Bat	For projects within or in the vicinity of suitable fruit bat habitat, surveys following the USFWS-approved JRM protocol will be conducted 1 week prior to the onset of work. If a fruit bat is present within 492 feet (150 m) of the project site, the work must be postponed until the bat has left the area.	Avoid and minimize impacts to fruit bats	Pre-C and C
Guam Landscaping Guidelines	Appropriate or non-invasive species will be planted in all new landscapes.	Helps to reduce potential impacts associated with non-native vegetation, promotes habitat for native species, reduces water consumption, and	C

		reduces the need for fertilizers.	
LFTRC Range Berm Controls	LFTRC range berms will contain native or non-invasive herbaceous vegetation, and other engineering controls. Recommended height of an exterior berm is 12 feet, constructed with 1:1 (soil type dependent) sidewall slopes, and a 4-foot-wide flat top. Recommended height of an interior berm is at minimum, 8 feet in height, up to the exterior berm height of 12 feet, with a 1:1 slope (soil type dependent) and a 4-foot wide flat top.	Helps to manage stormwater runoff and control erosion.	C
Biosecurity Measures	Incorporate biosecurity measures (e.g., brown treesnake interdiction measures, onsite vegetation waste management procedures, outreach/education, and monitoring to evaluate effectiveness of HACCP) into construction, operations or training events.	Inadvertent spread of non-native species on Guam or to other locations off of Guam. The implementation of biosecurity measures decreases the likelihood of introducing pests harmful (either predation or outcompeting native species) to native vegetation, invertebrates, vertebrates, as well as human health	Pre-C, C and Ops
Biosecurity Outreach and Education	The DON biosecurity outreach and education program is to inform the general public, DoD employees, military personnel, and their dependents regarding native vs. non-native species, impacts of non-native species on native species and ecosystems, and what can be done to prevent and control non-native species.	Inadvertent impacts to terrestrial biological resources due to lack of awareness of biosecurity issues related to non-native species.	Pre-C, C and Ops
Brown Treesnake Interdiction (36 Wing Instruction 32-7004, Brown Tree Snake Control Plan and COMNAVMAR Instruction 5090.10A, Brown Tree Snake Control and Interdiction Plan).	Joint Region Marianas (JRM) has established a comprehensive brown treesnake interdiction program to ensure that military activities, including the transport of civilian and military personnel and equipment to and from Guam, do not contribute to the spread of brown treesnakes. Interdiction requirements (e.g., trapping and inspections at ports and cargo facilities, aircraft, inspections of household good movements, and biosecurity plans for training events) are specified in DoD instructions as well as the annual Work Financial Plan that is developed in cooperation with USDA Wildlife Services.	Inadvertent spread of brown treesnake to other locations off of Guam	Pre-C, C and Ops
Protection of cycads	During construction activities, viable <i>Cycas micronesica</i> found within the project boundaries would be translocated to the maximum extent practicable.	Direct impacts to cycads	Pre-C and C
Protection of Mariana Eightspot Butterfly and Host Plants	Pre-construction butterfly and host plant surveys within suitable habitat within project boundaries. Salvage and translocate host plants, larvae or eggs to the maximum extent practicable.	Avoid and minimize direct impacts to adult, larvae, eggs and host plants of Mariana eightspot butterfly	Pre-C and C

Legend: C = construction; Ops = operations; Pre-C = preconstruction;

2.4 Conservation Measures to Minimize Potential Effects to Threatened and Endangered Species

This section describes the conservation measures the DON has or will implement to minimize effects on listed species due to construction and operations. Conservation measures are actions intended to benefit or promote the recovery of listed species as an integral part of the Proposed Action. These actions serve to minimize or compensate for, project effects on the species under review. Some conservation measures have been conducted as part of the 2010 BO for the 2010 ROD related actions, others were initiated as part of the 2010 BO and are being carried forward and some are new conservation measures designed to better address the impacts to threatened or endangered species as a result of the Proposed Action (Table 2-3).

Table 2-3. Conservation Measures Applicable to this BA
Regional Biosecurity Plan (Micronesia Biosecurity Plan)
Brown Treesnake Interdiction at the commercial ports
Brown Treesnake Research and Suppression
BTS Fence 160 ac unit
BTS Fence 300 ac unit
BTS suppression (160 acre unit)
BTS suppression (300 acre unit)
Cat Control (160 acre BTS Enclosure)
Cat Control (300 acre BTS Enclosure)
Rodent Control (160 ac BTS Encl)
Rodent Control (300 ac BTS Encl)
Forest enhancement
Install ungulate fence (Fin, N. Fin and Tarague)
Ungulate eradication/control (Fin, N. Fin and Tarague)
Invasive plant removal (Fin, N. Fin and Tarague)
Native plant outplanting (Fin, N. Fin and Tarague)
Native plant establishment (Fin, N. Fin and Tarague)
Serianthes Bracing
Sea Turtle Public Outreach
Mariana Fruit Bat Recovery Actions on Rota
Fencing of the Haputo ERA access trail
Development and installation of informational and educational signage
Monitoring of visitor use

2.4.1 Regional Biosecurity Plan

To address pathways and encourage a more holistic approach to managing invasive species, the DON has funded the development of the Micronesia Biosecurity Plan (now referred to as the Regional Biosecurity Plan). Individual activities for various species will continue, but the DON and others agree it is more efficient to manage pathways and prescribe corrective measures for a suite of species which will be monitored at discrete control points through time. The Regional Biosecurity Plan (RBP) will provide agencies in Micronesia and Hawaii with a platform for coordination and integration of inter-agency invasive species management efforts such as control, interdiction, eradication, and research.

1. Phase I Risk Assessments: DON contracted with the National Invasive Species Council to develop and coordinate risk assessments for the RBP in cooperation with USDA Wildlife Services, USDA APHIS Plant and Protection and Quarantine, USDA APHIS Veterinary Services (terrestrial); U.S. Geological

Survey Biological Resources Discipline (freshwater); and Smithsonian Environmental Research Center (marine).

2. Phase II Peer Review and Strategic Implementation Plan: In September of 2011, DON entered into a Cooperative Agreement with the University of Guam (UoG) to develop Phase II of the RBP. UoG has been tasked with reviewing all three sections of the RBP and providing an assessment as to whether the three sections are comprehensive within their respective environment and sufficiently address risks posed to Micronesia and Hawaii. UoG and its resource expert collaborators are evaluating each section of the RBP to ensure the plan sufficiently:

- a) evaluates the biosecurity risks particular to each environment;
- b) addresses organisms to be of greatest risk to Micronesia and Hawaii (as it relates to Micronesia);
- c) identifies the necessary elements of an effective biosecurity program;
- d) identifies management responses that are the most appropriate and have been described and prioritized in sufficient detail to allow for ease of implementation;
- e) incorporates the input of the relevant regional entities with responsibilities for biosecurity.

If the RBP does not adequately address specific biosecurity concerns raised by relevant regional entities, the review shall identify solutions to address these concerns.

UoG is also tasked with developing a Strategic Implementation Plan based on the results of RBP research components and subsequent independent peer review of the science and recommendations. The Strategic Implementation Plan is to:

- a) identify and analyze challenges to regional implementation of the RBP and provide multiple implementation alternatives, where appropriate;
- b) identify infrastructure, funding, processes, political, legislative, policy and capacity gaps within the various region's agencies and jurisdictions relevant to potential invasive species pathways;
- c) identify policy and regulatory changes needed to achieve 100 percent prevention, control and treatment for the identified highest risk pathways, ports of origin, and species for the region;
- d) evaluate the technical and institutional capacity (staff, training, etc.);
- e) assess infrastructure needs;
- f) coordinate with related initiatives; seek out successful models, assistance and collaboration from organizations involved in invasive species management; analyze biosecurity program implementation elsewhere and assess applicability to Micronesian Rregion;
- g) target outreach and awareness;
- h) identify potential long-term funding mechanisms;
- i) identify methods for measuring success/effectiveness, as well as the labor/equipment costs, in U.S. dollars, required to maintain those methodologies;
- j) address improvement of biosecurity protection actions;
- k) address biological threats associated with enhanced military activities, tourism, trade, business and the economic growth;
- l) recommend solutions to challenges;
- m) recommend strategies (and associated budgetary needs to implement each strategy) to achieve 100 percent prevention, control and treatment for the identified highest risk pathways, ports of origin, and invasive species for the region;
- n) provide a template to realistically implement the biosecurity strategies identified in the RBP in the United States and within international frameworks.

In May of 2014, UoG will host a regional workshop in order for the jurisdictions and development partners to have a final joint working session in which to review and conclude the updating of the

implementation component before finalizing the RBP. The draft RBP will be provided to participants prior to the meeting for their review and comment. The final RBP will be completed in 2014.

2.4.2 Brown Treesnake Research and Suppression

The DON has initiated support for large-scale, long-term efforts to refine methods for brown treesnake control that will reduce the snake population on a landscape level more cost-effectively and increase the efficacy of capturing snakes in low-density situations.

In early fiscal year (FY) 2012, the DON coordinated with the USFWS, USDA, and USGS on priority BTS research projects. The development of a bait formulation for BTS suppression was determined to be the highest priority research need. The USDA National Wildlife Research Center (NWRC) was funded at the start of FY13 to implement the bait formulation research.

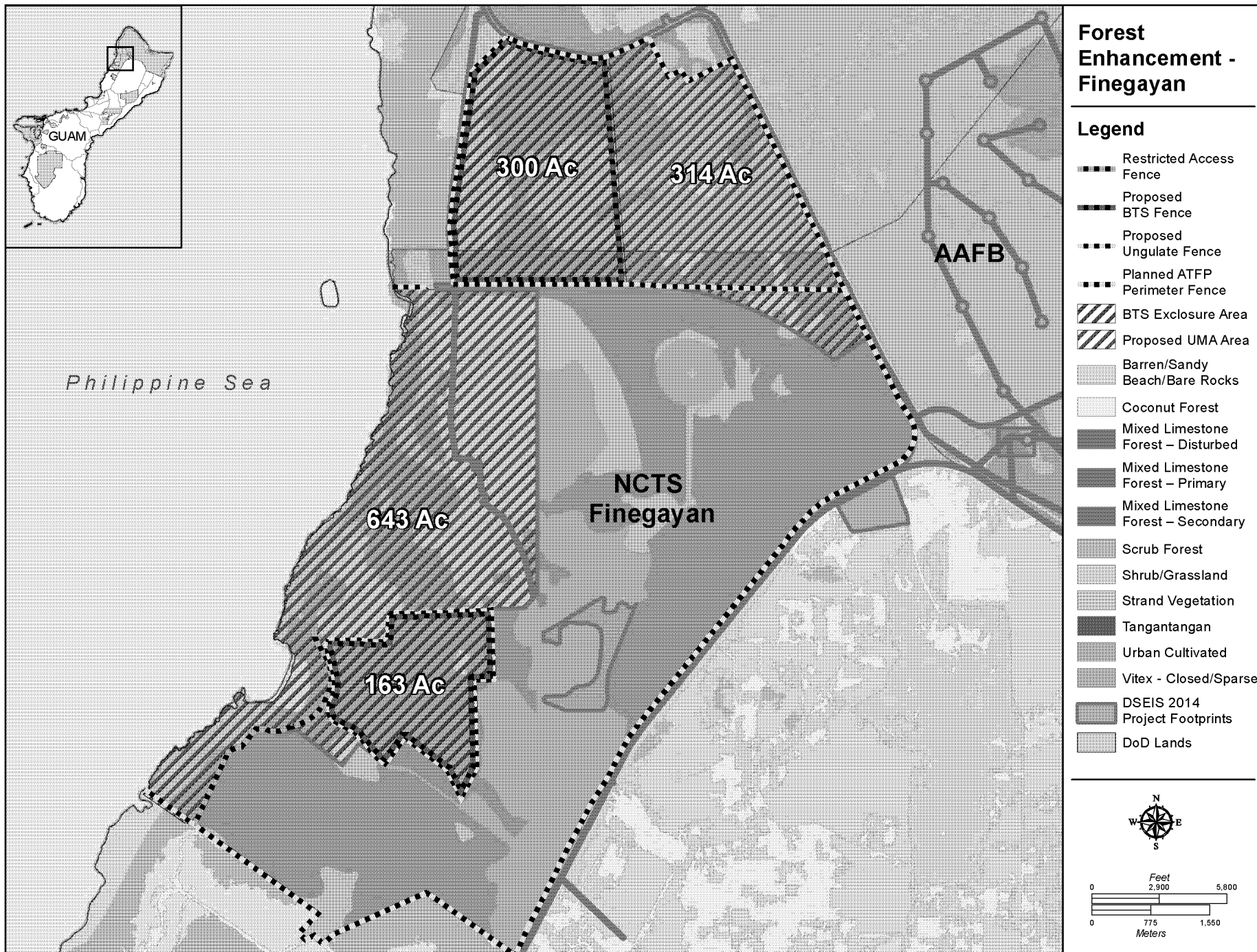
The DON will continue to fund selected research/design projects identified as priorities in the Brown Treesnake Technical Working Group Strategic Plan that are compatible with the military mission on Guam for up to 10 years from the start of cantonment construction. Dependent upon the success of current experimental suppression activities within the Habitat Management Unit (HMU) or identification of an effective alternate technology, the DON would install a brown treesnake barrier to exclude brown treesnakes from approximately 160 acres (65 ha). If the DON is successful at eradicating brown treesnakes within these 160 acres (65 ha), the DON would install a second brown treesnake barrier to exclude brown treesnakes from approximately 300 acres (121 ha) (Figure 2-17).

2.4.3 Brown Treesnake Interdiction

JRM has established a comprehensive brown treesnake interdiction program to ensure that military activities, including the transport of civilian and military personnel and equipment to and from Guam, do not contribute to the spread of brown treesnakes to other islands or regions. Brown treesnake interdiction requirements (e.g., trapping and inspections at ports and cargo facilities, aircraft, inspections of household good movements, biosecurity plans for training events) are specified in DoD instructions (i.e., 36 Wing Instruction 32-7004, *Brown Tree Snake Control Plan* (Appendix A) and COMNAVMAR Instruction 5090.10A, *Brown Tree Snake Control and Interdiction Plan* (Appendix B)) as well as the annual Work Financial Plan that is developed in cooperation with USDA Wildlife Services. The Proposed Action would continue to comply with these established procedures.

The 2010 BO stated “The DoI agrees that it is not DON’s responsibility to fund increased interdiction measures that are identified more than one year after the end of the fiscal year in which both Marine Corps relocation construction undertaken to implement the proposed relocation decisions made in the Record of Decision (ROD) for the “Environmental Impact Statement/Overseas Environmental Impact Statement for Guam and CNMI Military Relocation: Relocating Marines from Okinawa, Visiting Aircraft Carrier Berthing, and Army Air and Missile Defense Task Force” has ended and the permanent nontransient Marine Corps military units relocated as a result of decisions made in that ROD have concluded their relocation to Guam. For the purposes of this Project Description, interdiction is defined as: “to hinder, prohibit, or prevent the brown treesnake from becoming established in new locations by conducting inspection and suppression processes.””

The DON agrees that it will fund the increase of current federally funded brown treesnake interdiction measures (in Guam, CNMI, and Hawaii) where the increase is related to direct, indirect and induced growth caused by the Marine Corps relocation to Guam. The FY10 level of funding for the Federal interagency brown treesnake interdiction effort on Guam, CNMI, and Hawaii and 2010 transportation levels associated with outbound cargo from Guam for the U.S. or U.S. territories will be used as the



baseline. That funding will continue and become part of the DON's current brown treesnake interdiction funding under authority of the Brown Tree Snake Control and Eradication Act (7 USC § 8501 note) (USFWS 2010a).

2.4.4 Biosecurity Outreach and Education

DON has contracted for the development of biosecurity outreach and education materials. The contractor has designed and produced an activity booklet, a tri-fold, two sided educational brochure with an associated poster that differentiates native from introduced species, defines invasive species, describes the known impacts of invasive species on native species and ecosystems, and what can be done to prevent and control invasive species. The brochure will serve to educate DoD employees and the public about current invasive species issues. The activity booklet is targeted towards elementary age children with a variety of activities, including but not limited to coloring, word search, connect the dots, for elementary school children, teaching them about invasive species.

2.4.5 Forest Enhancement

The DON proposes to implement forest enhancement on a minimum of 1,280 acres (518 ha) for impacts related to the Proposed Action (Figures 2-17 and 2-18). Forest enhancement would include **but is not limited** to the following actions:

- | Ungulate management consisting of exclusion fencing and active control (i.e. trapping, snaring, shooting) with the goal of eradication within the fenced areas;
- | Non-native, invasive vegetation removal; and/or
- | Propagation, planting, and establishment of dominant and rare species that are characteristic of native limestone forest habitats (e.g., *A. mariannensis*, *G. mariannae*, *F. prolixa*, *M. citrifolia*, *C. micronesica*, *W. elliptica*, *S. nelsonii*, *H. longipetiolata*, *T. rotensis*).

The anticipated benefit of implementing these mitigation measures is improved habitat quality for native flora and fauna. Forest enhancement would also support natural regeneration and seed propagation, reduce erosion, and increase water retention (i.e., reduces fire risk).

As part of the 2010 BO, the DON initiated two complementary ungulate management projects on Naval Base Guam (NBG) in 2013:

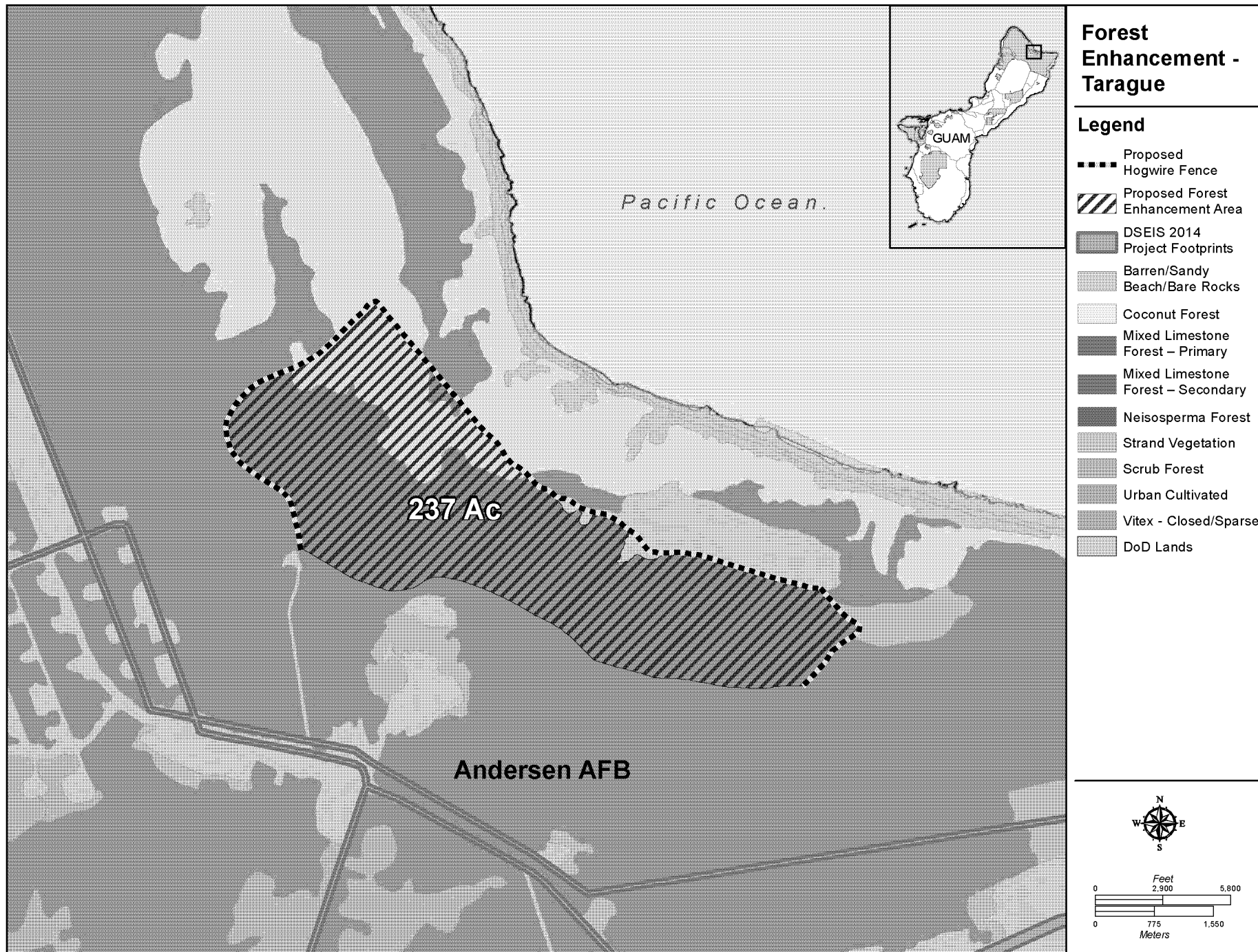
1) installation of approximately 4,400 feet of coated chain link fence along Route 2A on the perimeter of NBG. The fencing project is intended to effectively close off Orote peninsula from ungulate incursion and only entry control gates will be left unfenced. These gates are manned twenty-four hours a day/seven days a week.

and

2) ungulate control work on NBG with USDA.

The fencing project, in conjunction with USDA trapping efforts will reduce ungulate densities on NBG properties. Fence maintenance will periodically be conducted in the event storm damage or other influences (ie corrosion) dictate repair. The ultimate goal of the project is sustained suppression to levels that allow for forest regeneration and self-sustaining populations of native animals.

In addition, as part of the P-101 North Ramp parking project, a perimeter fence has been constructed around a heavily vegetated sinkhole. One round of ungulate control (with volunteers) was conducted in



the fall of 2012. The fence may be removed to construct the Air Combat Element but the fence will be re-installed once construction is complete.

2.4.6 Serianthes Bracing

The one remaining adult *Serianthes* tree at NWF is in poor condition due to termites and rotting at the base. The tree is leaning which renders it more susceptible to snapping or toppling in the event of a catastrophic typhoon. Guide wires would be installed to support the tree at NWF thereby reducing the potential for its collapse.

2.4.7 Sea Turtle Public Outreach

The DON, in cooperation with DAWR, has undertaken an educational program to inform military and civilian personnel about sea turtle nesting and the potential impacts to the species from nest disturbance, direct harassment of sea turtles (in the marine and terrestrial environment), beach disturbance, and other threats. DON developed of an activity booklet for elementary school children, teaching them about sea turtle conservation, a poster and a tri-fold brochure.

2.4.8 Mariana Fruit Bat Recovery Actions on Rota

In September of 2011, the DON awarded a Cooperative Agreement to the University of Montana for Mariana fruit bat recovery actions on Rota. The project focus and deliverables align with recovery actions contained within the Draft Revised Recovery Plan for the Mariana Fruit Bat (USFWS 2009b). Recovery actions supported by the University of Montana project included: (1) synthesizing recent research in order to update the recovery goals in the Recovery Plan, (2) conducting population genetics using fruit bat fecal samples as a source of fruit bat DNA, (3) establishing a standardized monitoring protocol, and (4) encouraging education and involvement of local communities at multiple levels. This project was completed in June of 2013 (REFERENCE).

The 2010 BO stated the “DON will ensure funding for two biologists on Rota for a 12-year period, beginning in FY11 to conserve the Mariana crow and the Mariana fruit bat.” However, due to NDAA restrictions, DON was only able award the project mentioned above in FY11. In light of the fact that the USFWS has indicated that the reintroduction of the currently extirpated species on Guam is reasonably certain to occur during the time frame of the Proposed Action, DON does not plan to continue with the implementation of this conservation measure but rather focus on conservation measures that improve habitat quality on Guam.

2.4.9 Fencing of the Haputo ERA access trail, signage and education

Fencing to manage access would assist in maintaining the characteristics and integrity of the Haputo ERA and would prevent overuse and potential damage to terrestrial biological resources. These measures are consistent with the goals and objectives of the Haputo ERA Management Plan (NAVFAC Marianas 2010). In addition, DON proposes to develop and install informational and educational signage on the cliffline above the Haputo ERA. The educational materials would educate military and civilian personnel on the sensitive biological resources within the Haputo ERA. In accordance with the Haputo ERA Management Plan, DON proposes to monitor visitor usage of the area to document usage and prevent overuse and potential damage to terrestrial biological resources.

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CHAPTER 3

DESCRIPTION OF THE ACTION AREA AND THE LISTED SPECIES THAT MAY BE AFFECTED

3.1 ACTION AREA

The action area is defined as all areas that may be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. It encompasses the geographic extent of environmental changes (i.e., the physical, chemical and biotic effects) that will result directly and indirectly from the action. The 2010 BO described the action area as the areas within which the action is likely to produce stressors that have direct or indirect adverse consequence to listed resources. The 2010 BO addressed the DoD construction and training on Guam and Tinian. Due to the changes in the Proposed Action, the action area has also changed and now only includes lands on Guam.

Key sources of information for this section include the 2014 draft SEIS, 2010 Final EIS; 2010 JGPO BO; the Joint Region Marianas (JRM) INRMP (JRM 2013); the Guam CWCS (GDAWR 2006); recovery plans (USFWS 1990a, 1993, 2005, 2008a, 2009b); Federal Register (2004); and previous EISs, Environmental Assessments, BAs, and resulting USFWS BOs for recent actions on military lands on Guam. In addition, information from site-specific surveys conducted for the 2010 Final EIS (NAVFAC Pacific 2010a) and project-specific biological and wetland surveys for the SEIS (NAVFAC Pacific 2013a, 2013b, 2013c, 2013d) were used. Site-specific natural resources GIS data for the project areas were obtained from NAVFAC Pacific and NAVFAC Marianas as of April 2014.

3.2 INTRODUCTION

This BA addresses the potential effects associated with the proposed Marine Corps actions on seven federally listed species and three proposed species that may be affected by the Proposed Action (Table 3-1).

On September 8, 2010, the USFWS issued its BO for the preferred alternative in the 2010 Final EIS (USFWS 2010a). In 2011, DON requested to amend the 2010 BO to address the changes in the program. The USFWS responded recognizing the need to delay implementing some of the conservation measures. In September of 2012, DON notified the USFWS of its plans to request an amendment to the BO to address those unaffected 2010-2015 projects/actions. On October 12, 2012, the USFWS stated that a consultation re-initiation request and BA (versus an amendment to the BO) was necessary to address the changes in the action. Consequently, on April 3, 2013, DON submitted a BA with a conclusion that the interim actions would “not likely to adversely affect” the Mariana fruit bat. DON’s request for re-initiation focused only on those species extant on Guam and did not include species that are listed under the Endangered Species Act but extirpated on Guam. JGPO could find no legal basis requiring consultation on extirpated species not present in the proposed action area based on its thorough research of existing USFWS regulations, policies, publically available guidance, and case law. After a series of meetings and conference calls, the USFWS acknowledged that current regulations and published USFWS guidance do not specifically address extirpated species, the USFWS advised the DON that consultation on effects to currently extirpated species is not unprecedented and is appropriate in this instance as the effects of the Proposed Action are likely to persist and overlap the period when reintroduction of the currently extirpated species on Guam is reasonably certain to occur and the species are likely to be exposed to the effects of the Proposed Action should it be implemented. The USFWS further noted that the situation regarding the Proposed Action could be distinguished from a project that would be

completed in the near term and where the effects of the action are not likely to persist and overlap the period when reintroduction of the currently extirpated species is reasonably certain to occur.

However, due to the amount of time it took to resolve the issues regarding extirpated species, the DON rescinded the BA and has prepared this BA to re-analyze the potential impacts on federally listed threatened and endangered species under the jurisdiction of the USFWS from DON actions addressed in the FEIS that are not affected by the April 2012 SCC joint statement and the actions addressed in the draft SEIS.

Table 3-1. Species Included in this Biological Assessment



Name	ESA Status	Habitat	Comments
Mariana fruit bat	T	Limestone forest, coastal forest, and coconut plantations.	Last observation in action area in 2011; few individuals occur throughout AAFB; no known colonial roost sites; recovery habitat present.
Mariana crow	E	All forests with a preference for native limestone forest.	Extirpated from Guam – last seen on Finegayan in the 1990s and on AAFB in 2012; recovery habitat present on Finegayan, South Finegayan, and AAFB.
Guam rail	E	Secondary habitats, some use of savanna and limestone forests.	Extirpated from the wild on Guam by 1985; recovery habitat present on Finegayan, South Finegayan, and AAFB; Recovery habitat present.
Guam Micronesian kingfisher	E	Forest and scrub with a preference for native limestone forest.	Extirpated from the wild on Guam by 1988; recovery habitat present on Finegayan, South Finegayan, and AAFB; recovery habitat present.
Green sea turtle	T	Suitable beaches for basking or nesting.	Haputo Beach: no known nesting (2 false crawls observed in 2008); no nesting observed during 2010-2012 surveys. Nesting beach habitat not within impacted areas; only within SDZs.
Hawksbill sea turtle	E	Suitable beaches for basking or nesting.	Only occur on Haputo and Tarague beaches.
Serianthes nelsonii	E	Limestone and ravine forests.	Known locations within impacted areas; recovery habitat present
Mariana eight-spot butterfly	C	Intact limestone forest with host species.	Fin: Y Host plants, eggs and larvae in Haputo ERA. S Fin: N Individuals and host plants not observed during 2010, 2012, and 2013 surveys. Host plants, adults, eggs and chrysalis observed in impacted areas during 2012 and 2013 surveys
Tabernaemontana rotensis	SOGCN	Native limestone forest.	AAFB: Y Large numbers observed in 2007 in central and southeastern areas; Occurs within impacted areas.
Cycas micronesica	SOGCN	Limestone forest, ravine forest, and savanna summits.	Observed during 2012 surveys of impacted areas.

3.3 MARIANA FRUIT BAT

Listing Status

The Guam population of the Mariana fruit bat was listed as endangered in August 1984 (USFWS 1984). In 2005, the USFWS reclassified the Mariana fruit bat from endangered to threatened status (USFWS 2005a). The reclassification was based on research indicating *Pteropus mariannus mariannus* is not a subspecies endemic only to Guam but the Guam population is part of a subspecies including bats on other islands that interact with each other (USFWS 2005). A five-year status review was completed in 2012 (USFWS 2012a) and a draft revised recovery plan for the Mariana fruit bat was completed in 2009 (USFWS 2009b).

Critical Habitat

In October 2004, approximately 376 ac (152 ha) of USFWS lands were designated as critical habitat for the fruit bat within the Ritidian Unit of the Guam National Wildlife Refuge (NWR) (USFWS 2004a).

Primary Constituent Elements

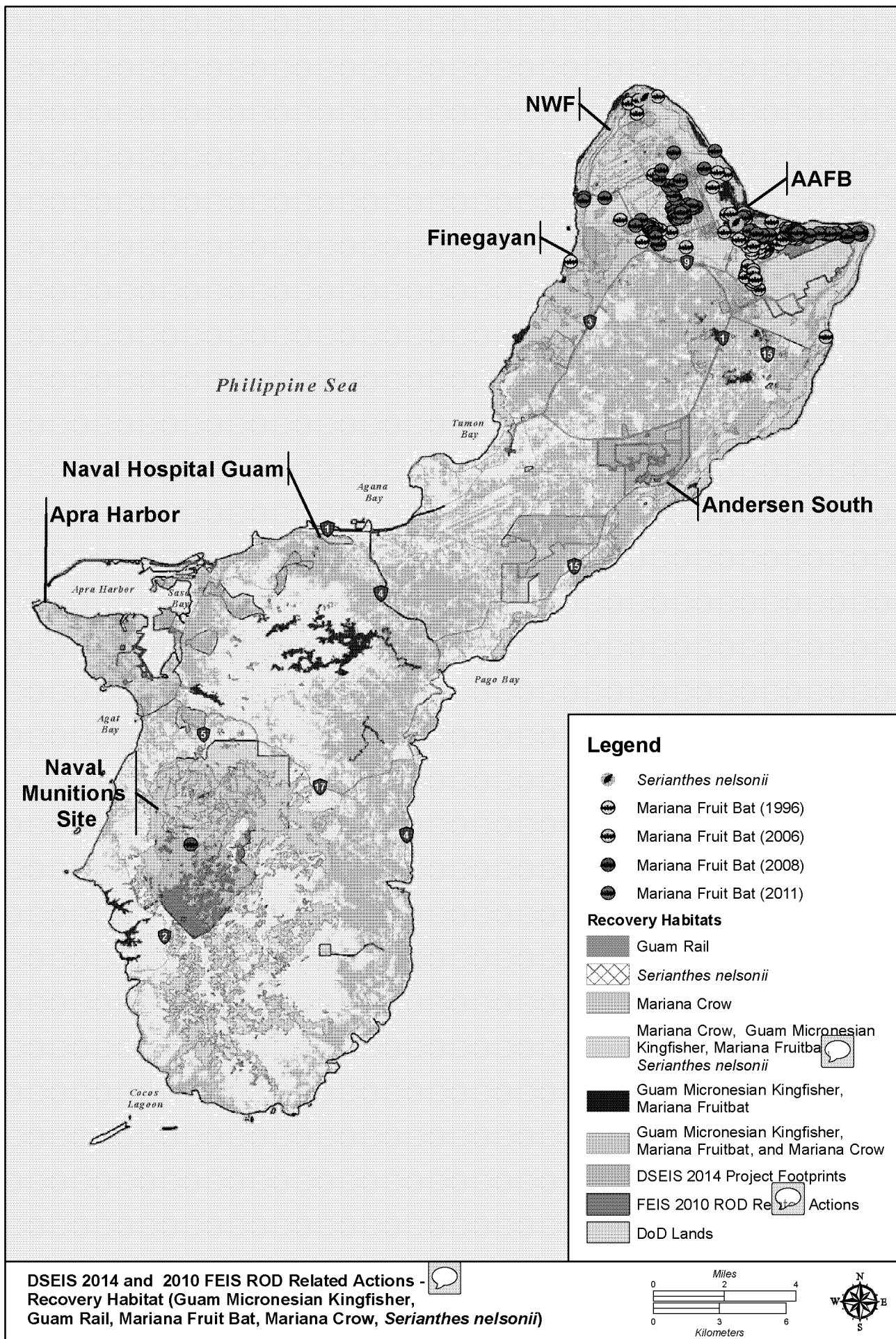
In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, the USFWS is required to consider those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. Such features are termed “primary constituent elements” and include, but are not limited to: Space for individual and population growth and for normal behavior; food, water, air, light, minerals and other nutritional or physiological requirements; cover or shelter; sites for nesting and rearing of offspring; and habitats that are protected from disturbance and are representative of the historical, geographical and ecological distributions of the species.

In the final rule for designating critical habitat for the Mariana fruit bat, the USFWS identified the primary constituent elements required by the Mariana fruit bat for the biological needs of foraging, sheltering, roosting, and rearing of young as being found in areas supporting limestone, secondary, ravine, swamp, agricultural, and coastal forests composed of native and introduced plant species (USFWS 2004a). These forest types provide the primary constituent elements of:

- (1) Plant species used for foraging, such as breadfruit, papaya, fadang, fig, kafu, coconut palm, and talisai; and
- (2) Remote locations, often within 328 ft (100 m) of clifflines that are 260 to 590 ft (80 to 180 m) tall, with limited exposure to human disturbance and that contain mature fig, chopak, gago, pengua, panao, fagot, and other tree species that are used for roosting and reproductive activity.

Recovery Habitat

Unlike recovery plans or critical habitat which are discussed in the Endangered Species Act involving public notice and publication in the Federal Register, “recovery habitat” is a term that was defined in the 2010 BO by the USFWS to mean “habitat that is currently suitable to support the recovery of listed species.” For the fruit bat, recovery habitat includes the following vegetation communities (based on vegetation mapping by the USFS [2006]) for foraging, roosting, and breeding: primary and secondary limestone forest, coconut plantation, ravine forest, and groves of ironwood. According to the 2010 BO, a total of 29,308 ac (11,860 ha) of Mariana fruit bat recovery habitat remains on Guam (Figure 3-1).



Threats

The primary threats to the Mariana fruit bat throughout its range are illegal hunting, and habitat destruction both by volcanic eruptions and man-made disturbances. Illegal hunting and predation from BTS are widely accepted as reasons for lack of fruit bat recovery on Guam (USFWS 2009). Consumer demand remains the driving force for illegal hunting and has prevented the recovery of fruit bats in the southern CNMI (Brooke 2008: 2).

Distribution

On Guam, the sighting of Mariana fruit bat was considered to be “not... uncommon” in 1920 (Crampton 1921 in USFWS 2009b). However, by 1931, bats were uncommon on Guam, possibly because the introduction of firearms led to more hunting (Coultas 1931). In 1958, the Guam population was estimated to number no more than 3,000. This estimate had dropped to between 200 and 750 animals by 1995.

Mariana fruit bat population estimates on Guam in 2006 indicated fewer than 100 individuals (Janeke 2006). In 2009, the number of fruit bats on Guam was estimated to be less than 50 individuals (USFWS 2009b). Of the estimated 6,610-6,930 total Mariana fruit bat individuals, fewer than 20 occur on Guam, with the remaining occurring within the CNMI (USFWS 2010a). Over the past several decades, the population of fruit bats on Guam has continued to decline and the island-wide population is likely to be less than 50 bats (USFWS 2006b: 18; Brooke 2008: 1). Other than a few isolated periods of increase, fruit bats have been in long-term decline on Guam (USFWS 2009b), in response to a combination of threats.

There have been only three fruit bat observations within the Proposed Action area on AAFB since 2005 (Janeke 2006b as cited in AAFB 2008b; JRM *et al.* 2012b,c, d). Extensive surveys conducted throughout AAFB between December 2010 and December 2011 resulted in a conservative estimate of approximately 25 fruit bats (JRM *et al.* 2012a). Only 50 detections of individual bats were recorded during 84 station count surveys from March through September 2012, and no active fruit bat aggregation or colony site was discovered (JRM *et al.* 2012b).

Recent observations were of single flying and (in a few cases) roosting fruit bats and were most commonly observed in three general regions on AAFB: the cliffline extending from above the Combat Arms Training and Maintenance (CATM) Range east to Pati Point; in or near the Munitions Storage Area (MSA); and in the vicinity of the Habitat Management Unit (HMU) (JRM *et al.* 2012a).

From 2010 through November 2013, there have been five reports of one to three fruit bats in flight at the Guam NWR. Guam NWR personnel believe that fruit bats may roost near Star Cave at Ritidian Point on NWR property (Personal communication via email from Jennifer Cruce, Guam NWR to Anne Brooke, JRM, November 7, 2013).

At the Pati Point colony, there have been less than 100 bats observed at any time at the colony site. This colony has undergone dramatic short-term fluctuations in the past indicating that members of the colony may be able to migrate easily between Rota and Guam (COMNAV Marianas 2001b). Surveys conducted from June 2007 through April 2008 recorded 31-54 individuals with an average of 40 (Andersen AFB 2008d). Fifty-three survey counts at Pati Point colony site from 24 December 2010 to November 2011 had an average of 2.2 bats. Counts of solitary bats throughout the forest of AAFB did not locate other colonial roost sites. Extensive surveys conducted throughout AAFB between December 2010 and December 2011 resulted in a conservative estimate of approximately 25 fruit bats (JRM 2012b and 2012c). As of 2011, no new fruit bat colonies have been recorded anywhere on Guam (JRM 2012b and c). Tarague Basin is a major conduit for Mariana fruit bat travel between the main Pati Point colony and foraging areas at NWF, Ritidian Point, and portions of the AAFB. Recent surveys of the number of fruit

bats at the Pati Point colony have indicated very low (less than 5 bats in 2011) (JRM 2012b and c) attendance, indicating this colony site is no longer being used.

The Haputo ERA contains some of the best remaining fruit bat habitat on DON-managed lands (NAVFAC Marianas 2010a; JRM 2013). As fruit bats are known to travel 6-7.5 miles (10-12 km) to reach forage areas (USFWS 1990), it is expected that fruit bats from AAFB may occasionally use Finegayan, primarily forested areas adjacent to the Haputo ERA, for foraging, and possibly roosting. In 2008, during 10 observation days, one sighting was reported in the Haputo ERA and one in the northeastern portion of Finegayan (Brooke 2008). There are no known colonial roost areas at Finegayan.

It is likely that a small number of solitary-roosting fruit bats also occur on Navy lands (e.g., NAVMAG). Solitary individuals can move to and from roosting and foraging areas during the year.

The Mariana fruit bat is rarely observed at Naval Base Guam. One bat was sighted on NBG lands in 2008 during 90 hours of fruit bat surveys at 14 survey locations on or near NBG lands. It is likely that a small number of solitary-roosting fruit bats (> 10) also occur on NBG lands but were not observed.

Site assessments of the Working Dog Relocation and Apra Harbor Wharf Improvements projects were conducted on September 17, 2012 in support of the projects, however, due to the degree of development, industrial activity, and lack of sufficient suitable habitat and lack of recent documented sightings, surveys were not conducted for Mariana fruit bat.

Bat surveys were conducted March 18-20, 2013 by Ms. Jennifer Farley and Mr. Scott Vogt (Vogt and Farley 2013) on Andersen South. No bats were detected during these surveys and no bats are known to historically utilize the area.

A site assessment of the Tumon area was conducted on September 17, 2012, however, due to the degree of development, industrial activity, and lack of sufficient suitable habitat and lack of recent documented sightings, surveys were not conducted for Mariana fruit bat.

A site assessment of the Piti area was conducted on September 17, 2012, however, due to the degree of development, industrial activity, and lack of sufficient suitable habitat and lack of recent documented sightings, surveys were not conducted for Mariana fruit bat.

3.4 MARIANA CROW

Listing Status

The Mariana crow was federally listed as endangered on August 27, 1984 (USFWS 1984). A five-year status review was completed in 2007 (USFWS 2005b) and a draft revised recovery plan for the Mariana crow was completed in 2005 (USFWS 2005b).

Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Act as—(i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and, (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species (16 U.S.C. 1532(5)(A)).

Critical habitat designations identify, to the extent known using the best scientific and commercial data available, habitat areas that provide essential life cycle needs of the species (*i.e.*, areas on which are found the primary constituent elements, as defined at 50 CFR 424.12(b)).

The USFWS designated 376 acres of critical habitat for the Mariana crow (*Corvus kubaryi*) on the island of Guam and approximately 6,033 ac (2,442 ha) on the island of Rota in the Commonwealth of the Northern Mariana Islands (USFWS 2004a).

Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, the USFWS is required to consider those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. Such features are termed “primary constituent elements” and include, but are not limited to: Space for individual and population growth and for normal behavior; food, water, air, light, minerals and other nutritional or physiological requirements; cover or shelter; sites for nesting and rearing of offspring; and habitats that are protected from disturbance and are representative of the historical, geographical and ecological distributions of the species.

The primary constituent elements required by the Mariana crow for the biological needs of foraging, sheltering, roosting, nesting, and rearing of young are found in areas that support limestone, secondary, ravine, swamp, agricultural, and coastal forests composed of native and introduced plant species (USFWS 2004a). These forest types provide the primary constituent elements of:

- (1) Emergent and subcanopy trees with dense cover for breeding such as fagot, pengua, ifit, ahgao, aabang, fig, yoga, and *Tristiropsis obtusangula* (faniok);
- (2) Sufficient area of predominantly native limestone forest to allow nesting at least 950 ft (290 m) from the nearest road and 203 ft (62 m) from the nearest forest edge and to support Mariana crow breeding territories (approximately 30 to 91 ac (12 to 37 ha)) and foraging areas for nonbreeding juvenile crows; and
- (3) Standing dead trees and plant species for foraging, such as *Aglaia mariannensis* (maypunayo), breadfruit, coconut palm, fagot, *Hibiscus tiliaceus* (pago), ifit, tangantangan, *Ochrosia mariannensis* (langiti), kafu, ahgao, fig, and yoga.

Recovery Zones

In the 2005 recovery plan, the USFWS identified “recovery zones” within the best remaining crow habitat to guide where recovery efforts should be focused. Recovery zones in this recovery plan were defined as those areas that will allow for the long-term survival and recovery of the crow. The recovery plan states the recovery zones reflect a biological evaluation of areas important for the recovery of the crow. “The foremost concern in identifying aga [crow] recovery zones is determining the distribution of the remaining large tracts of good quality forest within the current and historical distribution of the aga in which recovery actions may occur.” (USFWS 2005b)

Recovery Habitat

Unlike recovery plans or critical habitat which are discussed in the Endangered Species Act involving public notice and publication in the Federal Register, “recovery habitat” is a term that was defined in the 2010 BO by the USFWS to mean “habitat that is currently suitable to support the recovery of listed species.” According to the 2010 BO, only limestone forest and ravine forest are considered likely habitat

to support Mariana crow recovery. The USFWS estimated there were approximately 14,831 ac (6,002 ha) of potential recovery habitat for the Mariana crow in northern Guam and 11,819 ac (4,783 ha) in southern Guam (USFWS 2010a) (Figure 3-1).

Threats

Primary threats to the Mariana crow throughout its range are habitat destruction and modification, predation by introduced predators such as cats, rats, mangrove monitor lizards (*Varanus indicus*), and brown treesnakes, human persecution, typhoons, and reproductive and small population problems (USFWS 1984, USFWS 2005b).

Brown treesnake predation is believed to be the overriding factor in the decline of Mariana crow on Guam (USFWS 2005b). Habitat degradation due to grazing by feral ungulates and range expansion of invasive plants are also factors (USFWS 2005b).

Distribution

The Mariana crow is considered extirpated in the wild on Guam (USFWS 2013b). The closest population of crows is on the island of Rota, approximately 56 miles (90 km) north of Guam.

3.5 GUAM MICRONESIAN KINGFISHER

Listing Status

The Guam Micronesian kingfisher was listed as endangered in 1984 (USFWS 1984), and was considered extirpated from the wild by 1988 (Wiles et al. 2003). A draft revised recovery plan for the Guam Micronesian kingfisher was completed in 2009 (USFWS 2008a). A five year status review was completed in March of 2012 (USFWS 2012a).

Critical Habitat

Critical habitat for the Guam Micronesian kingfisher was proposed in June of 1991 (USFWS 1991) and withdrawn in April of 1994 (USFWS 1994). In October 2004, approximately 376 ac (152 ha) of USFWS lands were designated as critical habitat for the Guam Micronesian kingfisher within the Ritidian Unit of the Guam National Wildlife Refuge (NWR) (USFWS 2004a).

Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, the USFWS is required to consider those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. Such features are termed “primary constituent elements” and include, but are not limited to: Space for individual and population growth and for normal behavior; food, water, air, light, minerals and other nutritional or physiological requirements; cover or shelter; sites for nesting and rearing of offspring; and habitats that are protected from disturbance and are representative of the historical, geographical and ecological distributions of the species.

In the 2004 final rule for designating critical habitat for the Guam Micronesian kingfisher, the USFWS identified the primary constituent elements required for the Guam Micronesian kingfisher for the biological needs of foraging, sheltering, roosting, nesting, and rearing of young as being found in areas that support limestone, secondary, ravine, swamp, agricultural, and coastal forests containing native and introduced plant species (USFWS 2004a). These forest types include the primary constituent elements of:

- (1) Closed canopy and well-developed understory vegetation; large (minimum of approximately 17 in (43 cm) dbh), standing dead trees (especially faniok, umumu, breadfruit, fig, and coconut palm); mud nests of *Nasutitermes* spp. termites; and root masses of epiphytic ferns for breeding;
- (2) Sufficiently diverse structure to provide exposed perches and ground surfaces, leaf litter, and other substrates that support a wide range of vertebrate and invertebrate prey species for foraging kingfishers; and
- (3) Sufficient overall breeding and foraging area to support kingfisher territories of approximately 25 ac (10 ha) each.

Recovery Habitat

Unlike recovery plans or critical habitat which are discussed in the Endangered Species Act involving public notice and publication in the Federal Register, “recovery habitat” is a term that was defined in the 2010 BO by the USFWS to mean “habitat that is currently suitable to support the recovery of listed species.” Limestone Forest, Ravine Forest, Coconut Plantation, and Palma Brave Grove were considered likely habitat to support Guam Micronesian kingfisher recovery. A total of 29,310 ac (11,861 ha) of Guam Micronesian kingfisher recovery habitat remains on Guam (Figure 3-1).

Threats

When the kingfisher was first listed in 1984, disease was believed to be the primary threat to the species on Guam (USFWS 1984). Since that time predation by the brown treesnake has been identified as the primary threat (Savidge 1987).

Primary threats to kingfishers include: low productivity in captive propagation; incremental habitat loss due to development and fire; habitat degradation from feral ungulate browsing and trampling; and predation risk from brown treesnake which currently limits reintroduction to Guam (USFWS 2008a). Currently, high density of brown treesnakes is the primary factor preventing the kingfisher’s survival and recovery on Guam.

Distribution

The Guam Micronesian kingfisher was considered extirpated from the wild by 1988 (Wiles et al. 2003). The species is only known to occur in zoos.

3.6 GUAM RAIL

Listing Status

The Guam rail was emergency listed as endangered on April 11, 1984. On August 27, 1984, the final rule listing the Guam rail as endangered was published (USFWS 1984). A nonessential experimental population was proposed on Rota on June 19, 1989 and the final rule published on October 30, 1989. A recovery plan covering native forest birds of Guam and Rota was prepared in 1990 (USFWS 1990b).

Critical Habitat

There is no critical habitat designated for the Guam rail.

Recovery Habitat

Unlike recovery plans or critical habitat which are discussed in the Endangered Species Act involving public notice and publication in the Federal Register, “recovery habitat” is a term that was defined in the 2010 BO by the USFWS to mean “habitat that is currently suitable to support the recovery of listed species.” The Guam rail prefers edge habitats, especially grassy or secondary vegetation areas which provide good cover; mature forest is deemed only marginal for the Guam rail (USFWS 1990b). Scrub forest, other shrubs and grasses, and urban cultivated are considered primary Guam rail habitat because they include shrubby edge habitat.

The 2010 BO estimated 24,698 ac (9,995 ha) of Guam rail recovery habitat available in the north of Guam and 24,866 ac (10,063 ha) in the south (Figure 3-1).

Threats

While the loss of habitat likely played a part in the extirpation of the Guam rail from Guam, several species of predators have been introduced to the Mariana Islands including feral dogs, cats, three species of rats (*Rattus exulans*, *R. rattus*, and *R. norvegicus*), a monitor lizard (*Varanus indicus*), and the brown tree snake (*Boiga irregularis*). However, the primary reason is believed to be from predation by cats and brown treesnakes. These are the two known threats that preclude the successful reestablishment of Guam rail on Guam.

Distribution

The Guam rail was believed to have been extirpated in the wild on Guam by 1987 (Wiles et al. 1995) and exists primarily in captivity on Guam and in mainland zoos.

3.7 GREEN AND HAWKSBILL SEA TURTLES

Listing Status

The green sea turtle was listed as threatened on July 28, 1978. The hawksbill sea turtle was listed as endangered June 2, 1970. There is no recovery plan covering the green or hawksbill sea turtles.

Critical Habitat

There is no critical habitat designated for the green or hawksbill sea turtles on Guam.

Recovery Habitat

The 2010 BO did not include recovery habitat for green or hawksbill sea turtles.

Threats – terrestrial

Threats to the green turtle on nesting grounds are representative of those also faced by hawksbill turtles. Storm events, including typhoons, may destroy nests because of flooding or piling of eroded sand on the nest site. Beach erosion due to wave action may decrease the availability of suitable nesting habitats and result in a decline in the nesting rate. A number of non-native and native predators dig into nests and prey upon incubating eggs, while some predators, including birds, may take hatchlings just prior to or during their emergence from nests.

Human crowding of nesting beaches can disturb nesting females and prevent laying of eggs. Flashlight use, beach fires, and artificial lighting on human structures may deter females from coming up onto a

beach or may disorient hatchlings as they emerge from nests and try to find the sea (Witherington and Martin 1996). Emerging hatchlings may respond to the effects of artificial lighting by causing hatchlings to move in the wrong direction (*misorientation*) and/or interfere with their overall ability to orient (*disorientation*), which causes hatchlings to move in circles attempting to orient in the correct direction. Both behaviors can result in hatchling mortality through exhaustion, dehydration, predation, and other causes (Mann 1977; Witherington and Martin 1996).

An increased human presence may lead to an increase in the presence of domestic pets (which can depredate nests) and may lead to an increase in litter (which may attract wild predators). Trampling can increase sand compaction, which may damage nests or hatchlings. Humans may also introduce exotic vegetation in conjunction with beach development that can overrun nesting habitat or make the substrate unsuitable for digging nest cavities.

An increase in human population often relates to an increase in coastal development. Construction on or in the vicinity of sea turtle nesting beaches can result in sand compaction, beach erosion, and increase in direct and ambient light pollution. The rate of habitat loss because of erosion and escarpment may be increased when humans attempt to stabilize the shoreline, either through re-nourishment or through placement of hard structures, such as sea walls or pilings. Off-road vehicle traffic also contributes to habitat loss through erosion, especially during high tides or on narrow beaches where driving is often concentrated on the high beach and fore dune.

One of the most substantial threats to nesting sea turtles in the Pacific Islands remains the illegal poaching of adults and eggs (NMFS and USFWS 1998a). The direct harvest of adult nesting females can increase the rate of local extinction. Harvesting of eggs reduces the chance that recruitment will replace the reduced breeding population.

Distribution

As described in the 2010 Final EIS, green sea turtles forage in offshore waters and nest on beaches at AAFB. The majority of nesting by this species occurs in northern Guam. Historically, the Explosive Ordnance Disposal (EOD) beach at AAFB has one of highest incidents of sea turtle nesting.

The green and hawksbill sea turtles potentially nest along the Haputo ERA beach. Two suspected nest attempts and two false crawls were documented between 2008 and 2010 at Haputo Beach (presumably of green sea turtles, although this is not confirmed) (Grimm and Farley 2008). No sea turtle activity was observed at Haputo beach during 51 beach surveys from October 2010 through August 2012 (NAVFAC Marianas 2011; Brindock 2012). Green sea turtle nesting is documented on AAFB at Tarague.

The hawksbill sea turtle has not been definitively determined to nest on Guam (JRM 2013). It has been observed offshore of Finegayan but there have been no known nesting attempts by this species at Haputo Beach (JRM 2013).

Green sea turtle nesting is documented on the Guam NWR to the north of the proposed impacted areas. The hawksbill sea turtle has not been definitively determined to nest on Guam (JRM 2013). There are no sea turtle nesting beaches within the proposed impacted areas associated with LFTRC.

The green and hawksbill sea turtles potentially nest along Tarague Beach to the north of the project areas.

3.8 SERIANTHES NELSONII

Listing Status

Serianthes nelsonii was listed as threatened on March 4, 1987. A five-year status review was completed in 2010 (USFWS 2010b). A recovery plan for *Serianthes nelsonii* was completed in February of 1994 (USFWS 1993).

Critical Habitat

There is no critical habitat designated for the *Serianthes nelsonii*.

Recovery Habitat

The 2010 BO did not include recovery habitat for *Serianthes nelsonii*. However, as part of the consultation, the USFWS provided the DON digital files depicting recovery habitat for *Serianthes nelsonii*. The digital files indicate there is approximately 11,668.31 ac (4,722 ha) of habitat on Guam suitable for *Serianthes nelsonii*. To date, the recovery plan for the species has not been updated to reflect the criteria for recovery of the species.

Distribution

There is only one remaining mature seed-bearing tree on Guam and it is in the NWF area above Ritidian Point within primary limestone forest. Two planted *Serianthes* saplings are located in the Tarague basin area approximately 4 miles (6.4 km) east of the lands considered under this alternative.

3.9 MARIANA EIGHT-SPOT BUTTERFLY

Listing Status

TBD

Critical Habitat

TBD

Distribution

Surveys in 2010 recorded a small patch of the host plant *Procris pedunculata* in the northern portion of Finegayan, near the border with the Haputo ERA and the known eight-spot butterfly area (NAVFAC Pacific 2010a). USFWS (2012b) reported records of two eight-spot butterfly populations for Tweed's Cave in the Haputo ERA. In addition to these observations, extensive host plant patches and five occurrences with adult or larval butterflies were documented during 2012 project specific surveys in the NWF area (NAVFAC Pacific 2013b). Surveys conducted in 2013 observed eightspot butterflies within the Haputo ERA at Pugua Point and both host plants (*Elatostema calcareum* and *Procris pedunculata*) at Haputo Beach (UoG 2014). Mariana eight-spot butterflies and host plants have been reported from the support areas on AAFB and adjacent lands (JRM 2013; NAVFAC Marianas 2013b; NAVFAC Pacific 2013a; UoG 2014). Surveys conducted in 2012 and 2013 at NWF have observed eight-spot butterfly adults, eggs, and chrysalis (NAVFAC Marianas 2013; NAVFAC Pacific 2013b; UoG 2014). All adult and larva observations were near the cliffline in the area of the proposed MPMG Range; host plant patches were present in this area. Mariana eight-spot butterflies and host plants have been reported north of North Ramp, and further north within Tarague basin (JRM 2013; NAVFAC Marianas 2013b; NAVFAC Pacific 2013a; UoG 2014).

3.10 TABERNAEMONTANA ROTENSIS

LISTING STATUS

TBD

Critical Habitat

TBD

Distribution

The distribution of this SOGCN was evaluated on AAFB in 2007 (UoG 2007). Over 21,000 *T. rotensis* individuals were found throughout AAFB at 265 mapped locations, primarily in the central portion of the base and near the limestone cliffs in the northeast. The species is present in the proposed cantonment/family housing, NWF, the proposed utility support areas in south-central AAFB and water well development areas (UoG 2014, AAFB 2008b; NAVFAC Pacific 2010a, 2013a).

3.11 CYCAS MICRONESICA

LISTING STATUS

TBD

Critical Habitat

TBD

Distribution

The cycad is found in many limestone forests throughout Guam, including AAFB, and is identified as a SOGCN because of the Asian cycad scale insect that is devastating the species.

This species has not been observed within the Finegayan and AAFB impacted areas associated with the cantonment/family housing alternatives during past surveys (AAFB 2008b; NAVFAC Pacific 2010a, 2013a, 2013b). The cycad occurs in secondary limestone forest, the dominant vegetation community within the proposed impacted areas in Finegayan. Recent surveys within the NWF area found numerous individuals that were in fair or poor condition due to the Asian cycad scale (NAVFAC Pacific 2013b; UoG 2014).

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CHAPTER 4

ANALYSIS OF POTENTIAL EFFECTS TO FEDERALLY LISTED SPECIES

4.1 APPROACH TO ANALYSIS

This chapter presents an analysis of potential direct and indirect effects on a federally listed species, critical habitat and habitat suitable for recovery from implementation of the Proposed Action. Potential activities that may affect federally listed species, critical habitat and habitat suitable for recovery include construction and operation of facilities. Direct effects are the direct or immediate effects of the project on the species or its habitat. Direct effects result from the Proposed Action including the effects of interrelated actions and interdependent actions. Indirect effects are those that are caused by the Proposed Action and are later in time, but still are reasonably certain to occur (e.g., attraction of predators due to development and human presence). All direct and indirect project effects on listed species, critical habitat and habitat suitable for recovery have been further classified and evaluated based on their anticipated longevity (i.e., temporary or permanent effects). Effects of the action under consultation are analyzed together with the effects of other activities that are interrelated to, and interdependent of, that action. Interrelated actions are those that are part of a larger action and depend on the larger action for its justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

As they relate to the federally listed species, critical habitat and habitat suitable for recovery considered in this BA, direct and indirect effects from proposed activities within the action areas have been evaluated herein based upon: (1) an understanding of the methods and equipment that would be used during construction and operation of facilities, (2) knowledge of the potential for such methods and equipment to disturb the natural resources on which the subject species depend, and (3) awareness of the types of effects that have resulted from similar actions in the past.

Stressors of the Proposed Action

Stressors associated with proposed construction and operation of facilities associated with the Proposed Action were identified based on previous consultations, particularly the formal consultation process for the MIRC EIS/OEIS and the JGPO FEIS and resulting BO's.

4.2 Potential Effects to the Mariana Fruit Bat

Species

Construction Noise

No direct impacts to the Mariana fruit bat are anticipated as a result of construction noise related impacts associated with the Proposed Action because no increase in the noise environment is anticipated. Construction projects at AAFB will be temporary and localized within existing noise contours that range from 60 to 85 decibel (dB) day-night average sound level.¹

¹ The day-night average sound level (DNL) is the A-weighted equivalent sound level for a 24 hour period with an additional 10 dB imposed on the equivalent sound levels for night time hours of 10 p.m. to 7 am. The noise between

Construction noise is generated by the use of heavy equipment on job sites and is short-term in duration (i.e., the duration of the construction period). Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. For a single point source, like a construction bulldozer, the sound level decreases by approximately 6 dBs for each doubling of distance from the source. Sound that originates from a linear, or 'line' source, such as a passing aircraft, attenuates by about 3 dBs for each doubling of distance where no other features such as vegetation, topography, or walls absorb or deflect the sound. Depending upon their nature, the ability of such features to reduce noise levels may range from minimally to substantially.

Construction noise typically confined within an installation boundary, occurs during daylight hours, and is only present during the period of construction.

The DON has and will continue to conduct preconstruction surveys to ensure no bats are occupying the vegetation to be removed. This BMP coupled with (1) reduced amount of vegetation disturbance, (2) few to no bats within the Proposed Action areas, and (3) the slower pace of construction will avoid or minimize the effects of construction on the Mariana fruit bat. However, incidental take in the form of harassment may occur for the small number of bats that remain on-island.

Lighting

No direct impacts to the Mariana fruit bat are anticipated as a result of construction related light impacts because none of the construction projects which have the potential to affect the Mariana fruit bat will use night-time lighting.

For the minimization of potential impacts to fruit bats related to facility operations, lighting will be designed to meet minimum safety, anti-terrorism, and force protection requirements.

To the maximum extent practical, hooded lights will be used at all new roads and facilities proposed for construction and use within Mariana fruit bat habitat.

Lighting associated with the Andersen South will be installed at parking and administrative facilities (DON 2010a).

Operations

The effect on the Mariana fruit bat of ongoing and increased noise resulting from increased jet aircraft and helicopter use of the main runways at Andersen Air Force Base was analyzed in the ISR Strike BO (USFWS 2006). In that consultation, the USFWS expected that noise effects would adversely affect the Mariana fruit bat to the extent that the nearby Pati Point colony would be abandoned by the 21 bats estimated to remain there in 2006. USFWS determined that fruit bats relocating from Pati Point to other, less-protected areas on the island likely would be shot opportunistically by hunters (USFWS 2006). In the ISR Strike BO, the USFWS concluded that the remaining fruit bats on Guam would be taken as a result of the proposed action, but that this incidental take would not jeopardize the continued overall existence of the Mariana fruit bat (USFWS 2006). Because noise from the ISR Strike BO and the 2010 JGPO BO was expected to occur contemporaneously, the USFWS stated it would not be possible to attribute the

the hours of 10 p.m. and 7 a.m. is artificially increased by 10 dB. This noise is weighted to take into account the decrease in community background noise of 10dB during this period.

incidental take to a single project so they assigned the incidental take and associated terms and conditions to both projects.

In 2011, the DON funded a Mariana fruit bat project that focused on recovery actions within the draft Mariana Fruit Bat Recovery Plan (2009b). This 18 month project by the University of Montana was a conservation measure of the 2010 BO.

In order to prevent the potential spread of brown treesnakes to islands with Mariana fruit bats, DON proposes to continue brown treesnake interdiction efforts at both military and commercial ports (refer to Section 4.2.3).

Prior to the 2010 BO being signed, DON funded the development of Phase I of the biosecurity plan (Refer to Section 2.4.1). As part of the implementation of the 2010 BO conservation measures, DON funded Phase II of the biosecurity plan. The overall purpose of the plan is to develop a more concerted effort to managing existing and future invasive species management in Micronesia and Hawaii. The development of this plan will benefit the Mariana fruit bat on Guam and the other islands on which it is found by providing a platform for coordination and integration of inter-agency invasive species management efforts such as control, interdiction, eradication and research.

Based on the potential direct and indirect effects on the Mariana fruit bat due to the proposed construction and operation of facilities on Guam, implementation of the Proposed Action **is likely to adversely affect** the Mariana fruit bat. This determination is consistent with the previous BO. The previous BO (USFWS 2010a) concluded the Proposed Action was “likely to adversely affect the Mariana fruit bat on Guam.” The previous conclusion was based on the USFWS anticipating that up to ten remaining Mariana fruit bats at the Pati Point natural area colony will be taken in the form of harassment due to loud aircraft noise resulting from the Proposed Action.

Critical Habitat

In October 2004, approximately 376 ac (152 ha) of USFWS lands were designated as critical habitat for the fruit bat within the Ritidian Unit of the Guam National Wildlife Refuge (NWR) (USFWS 2004a).

The area within the southwestern portion of the critical habitat area, adjacent to the Guam NWR boundary, would be used for the relocation of the existing Guam NWR administration buildings and visitor center that are currently located to the northeast, near Ritidian Point. Two additional areas near Ritidian Point in the center of the critical habitat area are developed areas containing the existing NWR administrative buildings, roads, and parking lots. In accordance with the final rule designating critical habitat (USFWS 2004a), developed areas were not designated critical habitat; therefore, proposed construction activities within these two areas would not affect critical habitat.

The proposed area for the new NWR administration buildings, visitor’s center, and associated road and parking lot contains 12 acres (5 ha) of primary limestone forest supporting both PCEs for fruit bat critical habitat. Noise and disturbance-related construction impacts would be temporary in nature. The proposed 12-acre (5-ha) construction area is already subject to daily human disturbance due to aircraft operations and other DoD activities at AAFB, and its proximity to the access road to the Guam NWR, adjacent beaches, and private property to the southwest. In addition, appropriate BMPs would be implemented during construction to avoid and minimize impacts to fruit bats (e.g., pre-construction fruit bat surveys and installation of appropriate lighting in the vicinity of fruit bat habitat [e.g., hooded lights will be used to the maximum extent possible to avoid and minimize the illumination of forest]). Although construction would directly impact 12 acres (5 ha) of designated critical habitat, the remaining critical habitat would remain functional (or retain the current ability for the PCEs to be functionally established) to serve the

intended conservation role for the fruit bat. Accordingly, given above, construction impacts would not appreciably diminish the value of the critical habitat for both the survival and recovery of the Mariana fruit bat.

Additional potential impacts to Mariana fruit bat critical habitat could occur during temporary construction activities (e.g., noise, lighting, and general human disturbance) and operations associated with the proposed ranges at NWF that would be adjacent to critical habitat. However, the 2004 designation of critical habitat by the USFWS (USFWS 2004a) stated that “the presence of auditory or visual human disturbances does not affect the presence of the primary constituent elements used to define critical habitat.” This area is already subject to daily human disturbance due to aircraft operations and other DoD activities at AAFB, and its proximity to the access road to the Guam NWR, adjacent beaches, and private property to the southwest. Implementation of BMPs (e.g., installation of hooded lights in the vicinity of fruit bat critical habitat) will be used to the maximum extent possible to avoid and minimize the illumination of forest and critical habitat.

In conclusion, the 364 acres (147 ha) of remaining critical habitat would remain functional to serve the intended conservation role for the species based on the USFWS's December 9, 2004 interim guidance to USFWS biologists conducting Section 7 consultations and the application of the “Destruction or Adverse Modification” Standard under Section 7(a)(2) of the Endangered Species Act (USFWS 2004b).

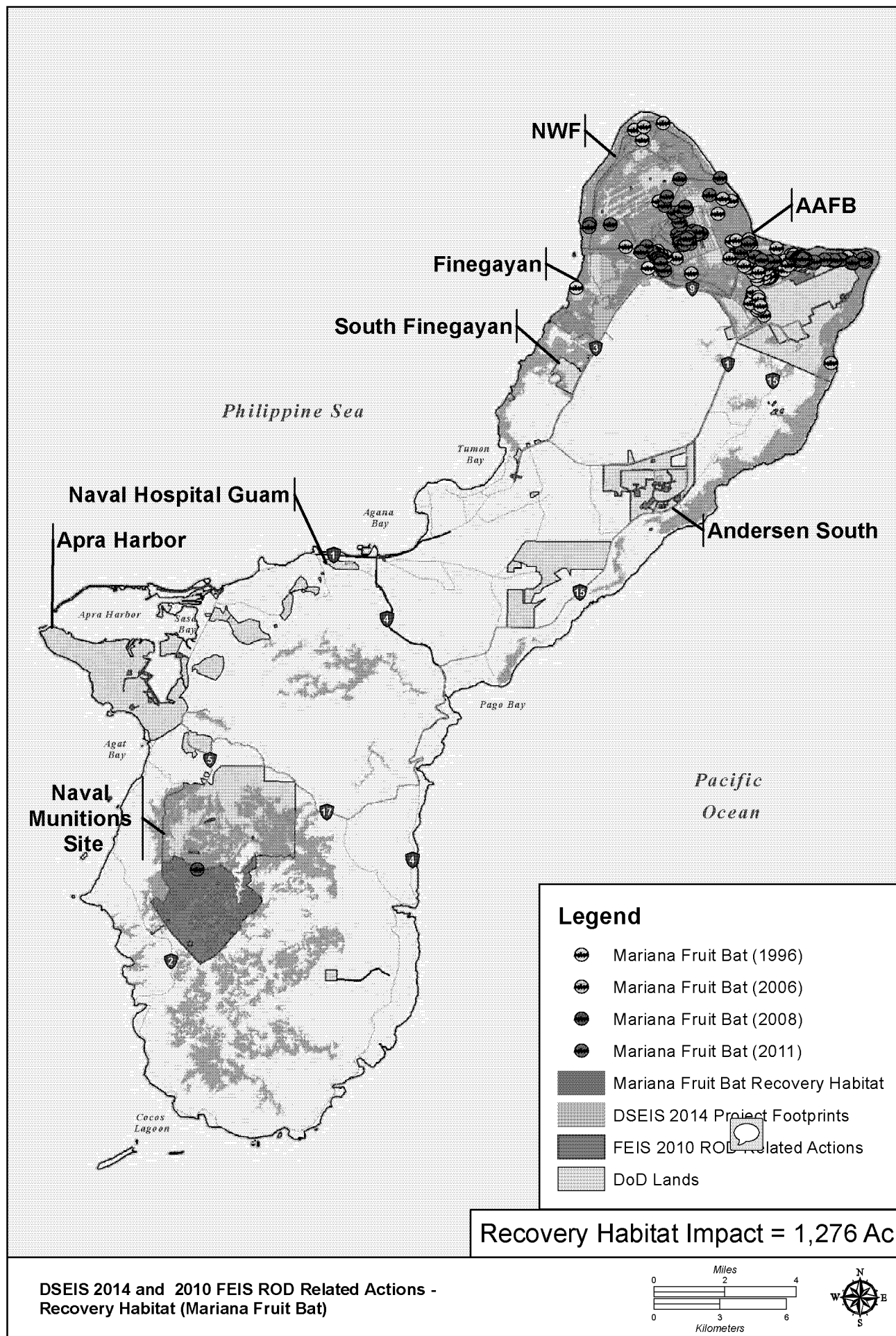
Recovery Habitat

The USFWS has identified approximately 29,308 ac (11,860 ha) of habitat on Guam suitable for the recovery of the Mariana fruit bat (USFWS 2010a). The 2010 BO estimated 1,524 acres of habitat suitable for the recovery of the Mariana fruit bat would be lost due to the Proposed Action (1,520 acres in the north and 4 acres in the south). The current Proposed Action is anticipated to impact approximately 1,276 acres of Mariana fruit bat recovery habitat (Figure 4-1). This is a decrease of 248 acres. To date, the recovery plan for the species has not been updated to reflect the criteria for determining habitat suitability for recovery of the species.

To minimize the effects of the Proposed Action on the Mariana fruit bat, the DON proposes to initiate forest enhancement equal to the amount of habitat suitable for the recovery of the Mariana fruit bat that is impacted. Forest enhancement would include:

- ▮ Ungulate management consisting of exclusion fencing and active control (i.e. trapping, snaring, shooting) with the goal of eradication within the fenced areas.
- ▮ Non-native, invasive vegetation removal.
- ▮ Propagation, planting, and establishment of dominant and rare species that are characteristic of native limestone forest habitats (e.g., *A. mariannensis*, *G. mariannae*, *F. prolixa*, *M. citrifolia*, *C. micronesica*, *W. elliptica*, *S. nelsonii*, *H. longipetiolata*, *T. rotensis*).

In addition, the DON proposes to fund selected research/design projects identified as priorities in the Brown Treesnake Technical Working Group Strategic Plan that are compatible with the military mission on Guam for up to 10 years from the start of main cantonment construction. Dependent upon the success of current experimental suppression activities within the HMU or identification of an effective alternate technology, the DON would install a brown treesnake barrier to exclude brown treesnakes from approximately 160 acres (65 ha). If eradication of brown treesnakes within these 160 acres (65 ha) is successful, the DON would install a second brown treesnake barrier to exclude brown treesnakes from approximately 300 acres (121 ha) and initiate eradication activities.



In response to decreased brown treesnake densities, the rodent population is expected to increase. In order to address this anticipated increase the DON would implement rodent control. Rodent control would benefit recovery habitat as well as the species.

The anticipated benefit of implementing these mitigation measures is improved habitat quality for native flora and fauna. As predation from the brown treesnake is one of the widely accepted reasons for lack of fruit bat recovery on Guam, brown treesnake research and suppression should benefit the species and other native species on Guam. Forest enhancement would also support natural regeneration and seed propagation, reduce erosion, and increase water retention (i.e., reduces fire risk).

The DON conservation measures are intended to support re-introduction of native endangered or threatened species on DoD lands on Guam consistent with species recovery plans. In further support of such recovery efforts, the DON intends to actively participate in recovery committees for endangered or threatened species on Guam. When the DON and USFWS mutually agree the constraints to reintroduction of native threatened or endangered species on DoD lands on Guam have been minimized to a point that a feasible and successful re-introduction of the affected species is more probable than not, the DON will work with the USFWS to develop a re-introduction plan and supporting programmatic biological opinion that ensures such re-introduction efforts are consistent with the species recovery plans and the military mission on Guam.

4.3 Potential Effects to the Mariana Crow

Species

Construction and Operations

The Mariana crow is considered extirpated in the wild on Guam (USFWS 2013b). The closest population of crows is on the island of Rota, approximately 56 miles (90 km) north of Guam. There are currently neither projected dates for reintroduction of the crow, nor successful suppression of the brown treesnake to a level which would support re-introduction. Until the crow is successfully re-introduced and then has the potential to be exposed to construction and operational activities, impacts to the crow would be limited to recovery prospects (addressed below). If crows are reintroduced and exposed to construction or operational activities, the DON would reinitiate consultation to address these issues.

In order to prevent the potential spread of brown treesnakes to islands with Mariana fruit bats, DON proposes to continue brown treesnake interdiction efforts at both military and commercial ports (refer to Section 4.2.3).

Critical Habitat

In October 2004, approximately 376 ac (152 ha) of USFWS lands were designated as critical habitat for the Mariana crow within the Ritidian Unit of the Guam National Wildlife Refuge (NWR) (USFWS 2004a).

The analysis of the potential effects to critical habitat for the Mariana crow are the same as stated in Section 4.2 for the Mariana fruit bat. As stated above, the 364 acres (147 ha) of remaining critical habitat would remain functional to serve the intended conservation role for the species based on the USFWS's December 9, 2004 interim guidance to USFWS biologists conducting Section 7 consultations and the application of the "Destruction or Adverse Modification" Standard under Section 7(a)(2) of the Endangered Species Act (USFWS 2004b).

Recovery Habitat

The USFWS has identified approximately 26,650 ac (10,785 ha) of habitat on Guam suitable for the recovery of the Mariana crow (USFWS 2010a). To date, the recovery plan for the species has not been updated to reflect the criteria for determining habitat suitability for recovery of the species.

The 2010 BO estimated a minimum of 14,926 acres (6,040 ha) were need to recover the species on Guam. The 2010 BO estimated 1,522 acres of habitat suitable for the recovery of the Mariana crow would be lost due to the Proposed Action (1,518 acres in the north and 4 acres in the south). The current Proposed Action is anticipated to impact approximately 1,280 acres of Mariana crow recovery habitat (Figure 4-2). This is a decrease of 242 acres.

To minimize the effects of the Proposed Action on Mariana crow recovery habitat, the DON proposes to initiate forest enhancement equal to the amount of habitat suitable for the recovery of the Mariana crow that is impacted. Forest enhancement would include:

- Ungulate management consisting of exclusion fencing and active control (i.e. trapping, snaring, shooting) with the goal of eradication within the fenced areas.
 - ┆ Non-native, invasive vegetation removal.
- Propagation, planting, and establishment of dominant and rare species that are characteristic of native limestone forest habitats (e.g., *A. mariannensis*, *G. mariannae*, *F. prolixa*, *M. citrifolia*, *C. micronesica*, *W. elliptica*, *S. nelsonii*, *H. longipetiolata*, *T. rotensis*).

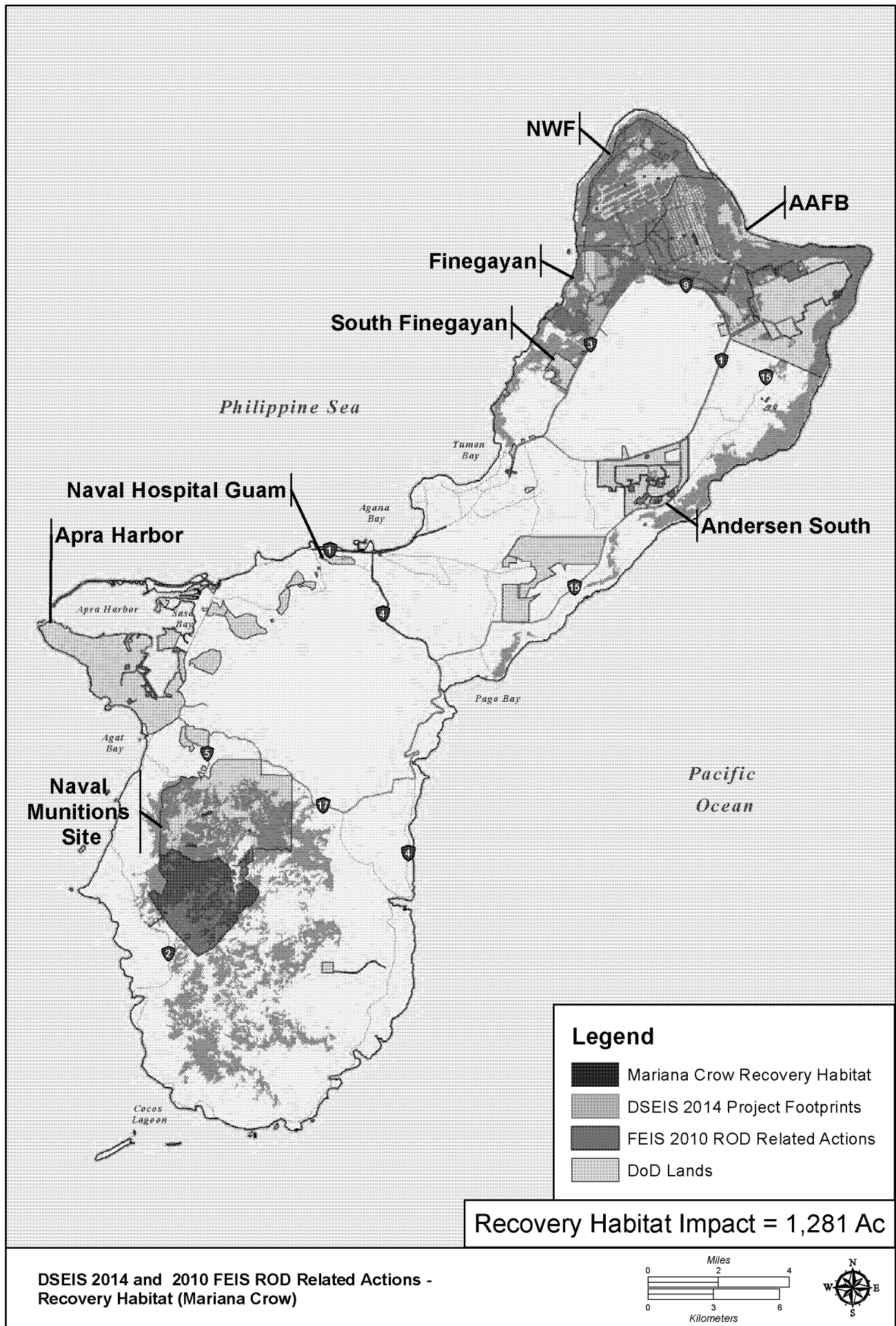
In addition, the DON proposes to fund selected research/design projects identified as priorities in the Brown Treesnake Technical Working Group Strategic Plan that are compatible with the military mission on Guam for up to 10 years from the start of main cantonment construction. Dependent upon the success of current experimental suppression activities within the HMU or identification of an effective alternate technology, the DON would install a brown treesnake barrier to exclude brown treesnakes from approximately 160 acres (65 ha). If eradication of brown treesnakes is successful within these 160 acres (65 ha), the DON would install a second brown treesnake barrier to exclude brown treesnakes from approximately 300 acres (121 ha) and initiate eradication activities.

In response to decreased brown treesnake densities, the rodent population is expected to increase. In order to address this anticipated increase the DON would implement rodent control. Rodent control would benefit recovery habitat as well as the species.

In addition, DON will implement cat control within the 160 acre and 300 acre BTS exclosures.

Prior to the 2010 BO being signed, DON funded the development of Phase I of the biosecurity plan (Refer to Section 2.4.1). As part of the implementation of the 2010 BO conservation measures, DON funded Phase II of the biosecurity plan. The overall purpose of the plan is to develop a more concerted effort to managing existing and future invasive species management in Micronesia and Hawaii. The development of this plan will benefit the Mariana fruit bat on Guam and the other islands on which it is found by providing a platform for coordination and integration of inter-agency invasive species management efforts such as control, interdiction, eradication and research.

The anticipated benefit of implementing these mitigation measures is improved habitat quality for native flora and fauna. As predation from the brown treesnake is believed to be the overriding factor in the decline of the Mariana crow on Guam (USFWS 2005b), brown treesnake research and suppression should benefit the species and other native species on Guam. In addition predation by cats are considered a



primary threat to the crow throughout its range (USFWS 1984, USFWS 2005b) so cat control should benefit this species. Forest enhancement would also support the recovery of the species as habitat degradation due to grazing by feral ungulates and range expansion of invasive plants are also factors in the decline of the Mariana crow (USFWS 2005b).

The DON conservation measures are intended to support re-introduction of native endangered or threatened species on DoD lands on Guam consistent with species recovery plans. In further support of such recovery efforts, the DON intends to actively participate in recovery committees for endangered or threatened species on Guam. When the DON and USFWS mutually agree the constraints to reintroduction of native threatened or endangered species on DoD lands on Guam have been minimized to a point that a feasible and successful re-introduction of the affected species is more probable than not, the DON will work with the USFWS to develop a re-introduction plan and supporting programmatic biological opinion that ensures such re-introduction efforts are consistent with the species recovery plans and the military mission on Guam.

4.4 Potential Effects to the Guam Micronesian Kingfisher

Species

Construction and Operations

The Guam Micronesian kingfisher was considered extirpated from the wild by 1988 (Wiles et al. 2003). The species exists primarily in captivity on Guam and in mainland zoos. There are currently neither projected dates for reintroduction of the kingfisher, nor successful suppression of the brown treesnake to a level which would support re-introduction. Until the kingfisher is successfully re-introduced and then has the potential to be exposed to construction and operational activities, impacts to the kingfisher would be limited to recovery prospects (addressed below). If kingfishers are reintroduced and exposed to construction or operational activities, the DON would reinitiate consultation to address these issues.

Critical Habitat

In October 2004, approximately 376 ac (152 ha) of USFWS lands were designated as critical habitat for the Guam Micronesian kingfisher within the Ritidian Unit of the Guam National Wildlife Refuge (NWR) (USFWS 2004a).

The analysis of the potential effects to critical habitat for the Guam Micronesian kingfisher are the same as stated in Section 4.2 for the Mariana fruit bat. As stated above, the 364 acres (147 ha) of remaining critical habitat would remain functional to serve the intended conservation role for the species based on the USFWS's December 9, 2004 interim guidance to USFWS biologists conducting Section 7 consultations and the application of the "Destruction or Adverse Modification" Standard under Section 7(a)(2) of the Endangered Species Act (USFWS 2004b).

Recovery Habitat

The USFWS has identified approximately 29,310 ac (11,561 ha) of habitat on Guam suitable for the Guam Micronesian kingfisher (USFWS 2010a). To date, the recovery plan for the species has not been updated to reflect the criteria for determining habitat suitability for recovery of the species.

The 2010 BO estimated a minimum of 26,268 acres (10,630 ha) were needed to recover the species on Guam. The 2010 BO estimated 1,524 acres of habitat suitable for the recovery of the Guam Micronesian kingfisher would be lost due to the Proposed Action (1,520 acres in the north and 4 acres in the south).

The current Proposed Action is anticipated to impact approximately 1,276 acres of Guam Micronesian kingfisher recovery habitat (Figure 4-3). This is a decrease of 248 acres.

To minimize the effects of the Proposed Action on Guam Micronesian kingfisher recovery habitat, the DON proposes to initiate forest enhancement equal to the amount of habitat suitable for the recovery of the Guam Micronesian kingfisher that is impacted. Forest enhancement would include:

- | Ungulate management consisting of exclusion fencing and active control (i.e. trapping, snaring, shooting) with the goal of eradication within the fenced areas.
- | Non-native, invasive vegetation removal.
- Propagation, planting, and establishment of dominant and rare species that are characteristic of native limestone forest habitats (e.g., *A. mariannensis*, *G. mariannae*, *F. prolixa*, *M. citrifolia*, *C. micronesica*, *W. elliptica*, *S. nelsonii*, *H. longipetiolata*, *T. rotensis*).

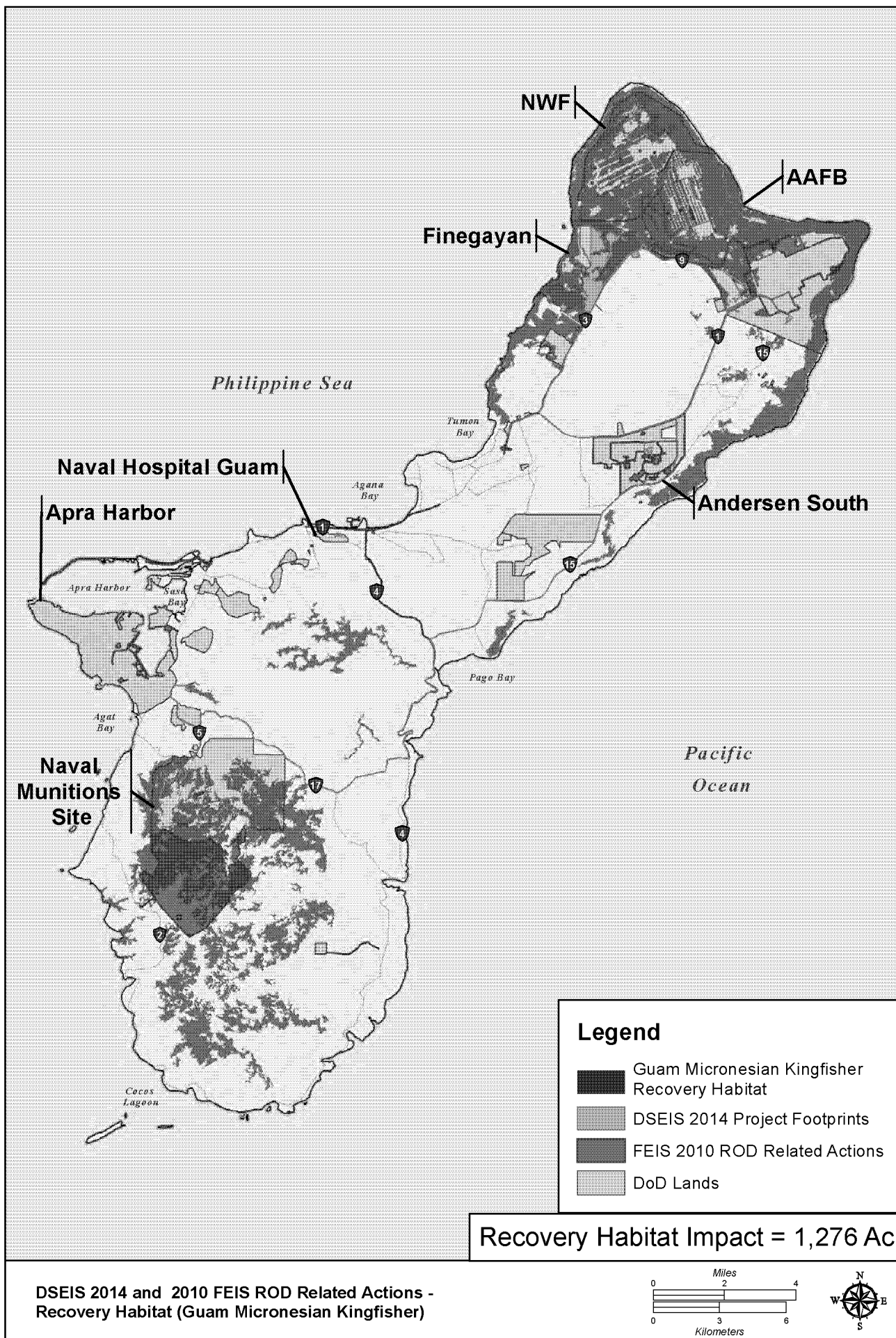
In addition, the DON proposes to fund selected research/design projects identified as priorities in the Brown Treesnake Technical Working Group Strategic Plan that are compatible with the military mission on Guam for up to 10 years from the start of main cantonment construction. Dependent upon the success of current experimental suppression activities within the HMU or identification of an effective alternate technology, the DON would install a brown treesnake barrier to exclude brown treesnakes from approximately 160 acres (65 ha). If eradication of brown treesnakes within these 160 acres (65 ha) is successful, the DON would install a second brown treesnake barrier to exclude brown treesnakes from approximately 300 acres (121 ha) and initiate eradication activities.

In response to decreased brown treesnake densities, the rodent population is expected to increase. In order to address this anticipated increase the DON would implement rodent control. Rodent control would benefit recovery habitat as well as the species.

Prior to the 2010 BO being signed, DON funded the development of Phase I of the biosecurity plan (Refer to Section 2.4.1). As part of the implementation of the 2010 BO conservation measures, DON funded Phase II of the biosecurity plan. The overall purpose of the plan is to develop a more concerted effort to managing existing and future invasive species management in Micronesia and Hawaii. The development of this plan will benefit the Mariana fruit bat on Guam and the other islands on which it is found by providing a platform for coordination and integration of inter-agency invasive species management efforts such as control, interdiction, eradication and research.

The anticipated benefit of implementing these mitigation measures is improved habitat quality for native flora and fauna. Currently, high density of brown treesnakes is the primary factor preventing the kingfisher's survival and recovery on Guam. Brown treesnake research and suppression should benefit the species and other native species on Guam. Forest enhancement would also support the recovery of the species as habitat degradation from feral ungulate browsing and trampling is also a factor in the decline of the kingfisher (USFWS 2008a).

The DON conservation measures are intended to support re-introduction of native endangered or threatened species on DoD lands on Guam consistent with species recovery plans. In further support of such recovery efforts, the DON intends to actively participate in recovery committees for endangered or threatened species on Guam. When the DON and USFWS mutually agree the constraints to reintroduction of native threatened or endangered species on DoD lands on Guam have been minimized to a point that a feasible and successful re-introduction of the affected species is more probable than not, the DON will work with the USFWS to develop a re-introduction plan and supporting programmatic biological opinion



that ensures such re-introduction efforts are consistent with the species recovery plans and the military mission on Guam.

4.5 Potential Effects to the Guam Rail

Species

Construction and Operations

The Guam rail was believed to have been extirpated in the wild on Guam by 1987 (Wiles et al. 1995) and exists primarily in captivity on Guam and in mainland zoos. There are currently neither projected dates for reintroduction of the rail on Guam, nor successful suppression of the brown treesnake to a level which would support re-introduction. Until the rail is successfully re-introduced and then has the potential to be exposed to construction and operational activities, impacts to the rail would be limited to recovery prospects (addressed below). If rails are reintroduced and exposed to construction or operational activities, the DON would reinitiate consultation to address these issues.

Critical Habitat

There is no critical habitat designated for the Guam rail.

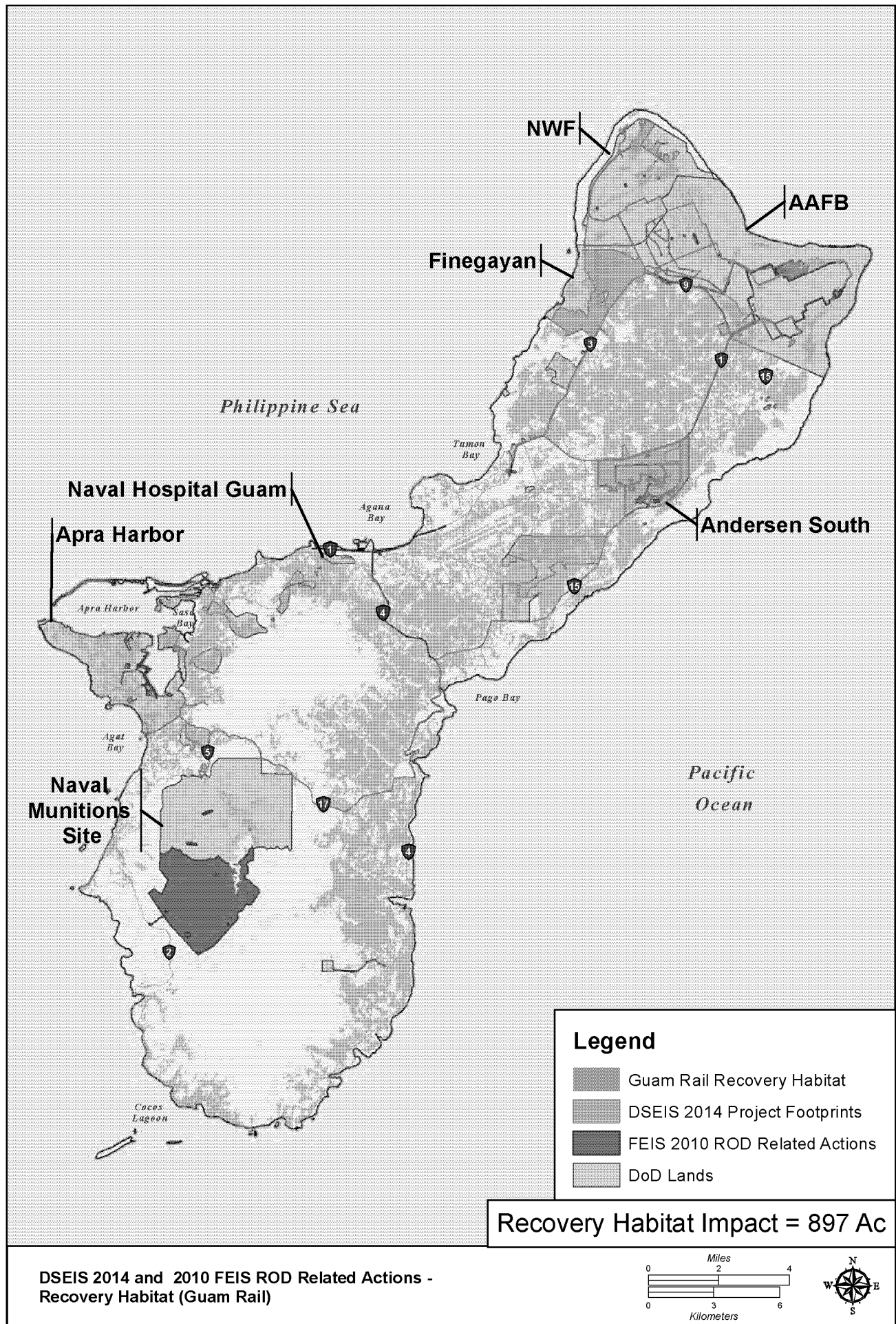
Recovery Habitat

The USFWS has identified approximately 49,564 ac (20,058 ha) of habitat on Guam suitable for the Guam rail (USFWS 2010a). The 2010 BO estimated a minimum of 41,184 acres (16,668 ha) were need to recover the species on Guam. In the 1990 recovery plan for the rail, the USFWS identified the interim recovery objectives for downlisting the Guam rail from endangered to threatened call as 1,000 birds in northern Guam and 1,000 birds in southern Guam (total = 2,000 individuals; USFWS 1990b). There were no criteria for delisting the species. The 2010 BO referenced an article by Trail et al. (2009) entitled “Pragmatic population viability targets in a rapidly changing world” that suggested that a minimum viable population target of 5,000 individuals is an appropriate target for species conservation. The article was not specific to rails or birds or any species but rather an overall approach to population targets. The recovery habitat criteria for the rail was based of an internal memorandum for February 2010 (Amidon 2010 in USFWS 2010a) and used the 5,000 individuals in the estimation of recovery habitat needed to delist the Guam rail. To date, the recovery plan for the species has not been updated to reflect the criteria for determining habitat suitability for recovery of the species.

The 2010 BO estimated 1,317 acres of habitat suitable for the recovery of the Guam rail would be lost due to the Proposed Action. The current Proposed Action is anticipated to impact approximately 970 acres of Guam rail recovery habitat (Figure 4-4). This is a decrease of 347 acres.

To minimize the effects of the Proposed Action on Guam rail recovery habitat, the DON proposes to initiate forest enhancement equal to the amount of habitat suitable for the recovery of the Guam rail that is impacted. Forest enhancement would include:

- | Ungulate management consisting of exclusion fencing and active control (i.e. trapping, snaring, shooting) with the goal of eradication within the fenced areas.
- | Non-native, invasive vegetation removal.



□ Propagation, planting, and establishment of dominant and rare species that are characteristic of native limestone forest habitats (e.g., *A. mariannensis*, *G. mariannae*, *F. prolixa*, *M. citrifolia*, *C. micronesica*, *W. elliptica*, *S. nelsonii*, *H. longipetiolata*, *T. rotensis*).

In addition, the DON proposes to fund selected research/design projects identified as priorities in the Brown Treesnake Technical Working Group Strategic Plan that are compatible with the military mission on Guam for up to 10 years from the start of main cantonment construction. Dependent upon the success of current experimental suppression activities within the HMU or identification of an effective alternate technology, the DON would install a brown treesnake barrier to exclude brown treesnakes from approximately 160 acres (65 ha). If the DON is successful at eradicating brown treesnakes within these 160 acres (65 ha), the DON would install a second brown treesnake barrier to exclude brown treesnakes from approximately 300 acres (121 ha).

In response to decreased brown treesnake densities the rodent population is expected to increase. In order to address this anticipated increase the DON would implement rodent control. Rodent control would improve recovery habitat quality and thereby benefit the listed species.

In addition, DON will implement cat control within the 160 acre and 300 acre BTS enclosures.

Prior to the 2010 BO being signed, DON funded the development of Phase I of the biosecurity plan (Refer to Section 2.4.1). As part of the implementation of the 2010 BO conservation measures, DON funded Phase II of the biosecurity plan. The overall purpose of the plan is to develop a more concerted effort to managing existing and future invasive species management in Micronesia and Hawaii. The development of this plan will benefit the Mariana fruit bat on Guam and the other islands on which it is found by providing a platform for coordination and integration of inter-agency invasive species management efforts such as control, interdiction, eradication and research.

The anticipated benefit of implementing these conservation measures is improved habitat quality for native flora and fauna. The primary reason for the decline in the Guam rail is believed to be from predation by cats and brown treesnakes. Brown treesnake research and suppression as well as cat control should benefit the species and other native species on Guam. Forest enhancement would also support the recovery of the species as habitat degradation is also a factor in the decline of the rail.

The DON conservation measures are intended to support re-introduction of native endangered or threatened species on DoD lands on Guam consistent with species recovery plans. In further support of such recovery efforts, the DON intends to actively participate in recovery committees for endangered or threatened species on Guam. When the DON and USFWS mutually agree the constraints to reintroduction of native threatened or endangered species on DoD lands on Guam have been minimized to a point that a feasible and successful re-introduction of the affected species is more probable than not, the DON will work with the USFWS to develop a re-introduction plan and supporting programmatic biological opinion that ensures such re-introduction efforts are consistent with the species recovery plans and the military mission on Guam.

4.6 Potential Effects to *Serianthes nelsonii*

Species

Construction and Operations

The only known mature *Serianthes* tree on Guam is located on the northwest corner of the potential impacted area associated with the proposed MPMG Range. The tree at NWF is in poor condition due to termites and rotting at the base. The tree is leaning which renders it more susceptible to snapping or toppling in the event of a catastrophic typhoon.

Current literature regarding the protection of trees from construction activities recommend a protective buffer based on the diameter at breast height (dbh) of the subject tree (Oregon State University 2009; University of Hawaii 2010; Johnson 2013). This buffer is related to the “critical root radius” approach which is calculated by measuring the dbh in inches. For each inch of dbh, allow for 1.5 feet (0.5 m) of critical root radius for sensitive, older, or unhealthy trees, or 1 foot (0.3 m) for tolerant, younger, healthy trees to ensure protection of the root zone. Therefore, based on the current dbh of 22.4 inches (57 cm) for the subject *Serianthes* at NWF, the buffer would be approximately 34 feet (10 m). To avoid any impacts to this tree, a minimum buffer of 100 feet (30 m) would be established around the tree and no activities would be permitted within this buffer. Therefore, there would be no impacts to the *Serianthes* tree with implementation of the proposed construction activities associated with the Proposed Action.

As a conservation measure, DON proposes to install guide wires to support the tree at NWF thereby reducing the potential for its collapse. In addition, the DON will coordinate with the USFWS regarding access to the tree for research/conservation purposes.

Critical Habitat

There is no critical habitat designated for *Serianthes nelsonii*.

Recovery Habitat

The 2010 BO did not include recovery habitat for *Serianthes nelsonii*. However, as part of the consultation, the USFWS provided the DON digital files depicting recovery habitat for *Serianthes nelsonii*. The digital files indicate there is approximately 11,668.31 ac (4,722 ha) of habitat on Guam suitable for *Serianthes nelsonii*. To date, the recovery plan for the species has not been updated to reflect the criteria for determining habitat suitability for recovery of the species.

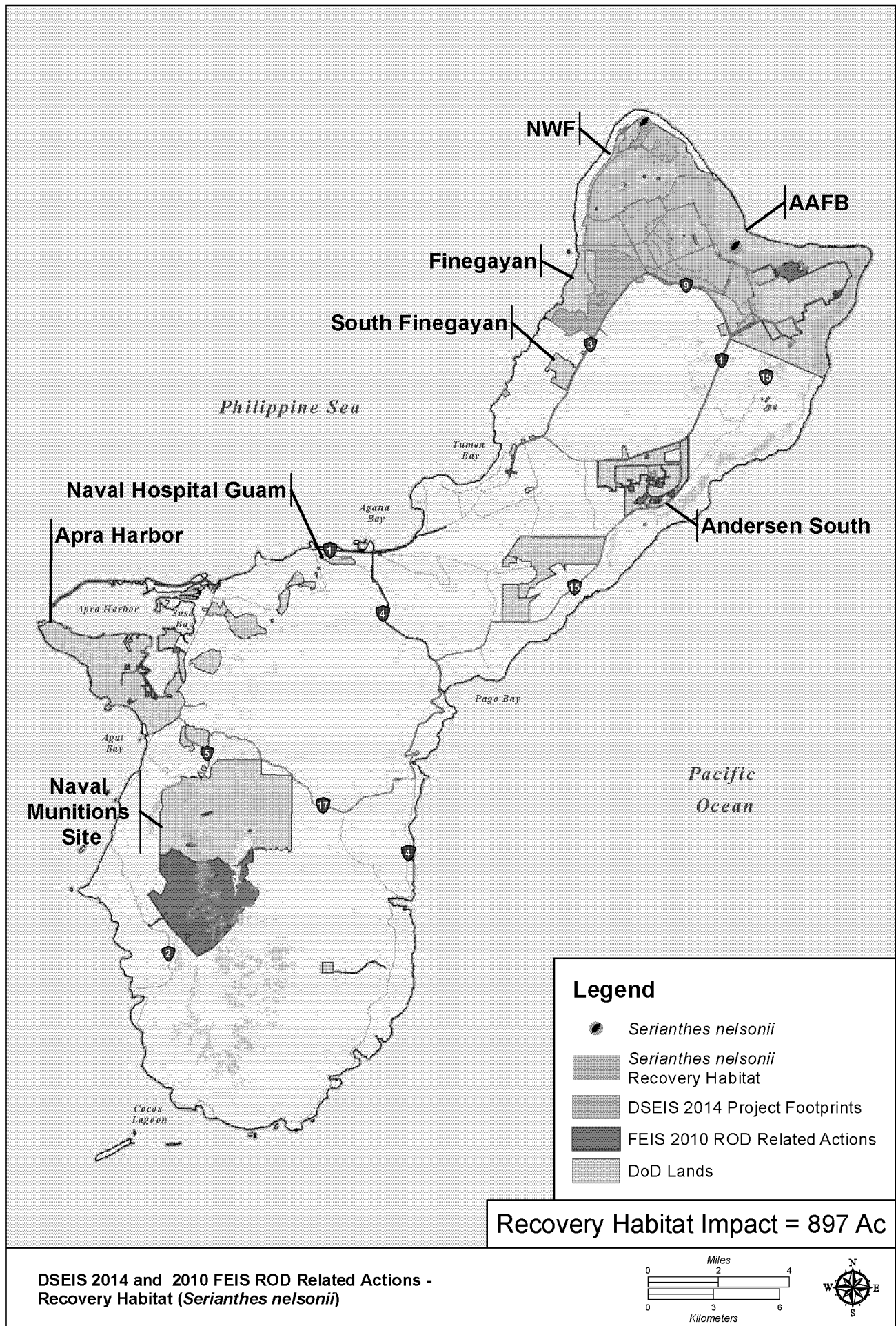
The current Proposed Action is anticipated to impact approximately 897 acres of *Serianthes nelsonii* recovery habitat (Figure 4-5).

To minimize the effects of the Proposed Action on Guam rail recovery habitat, the DON proposes to initiate forest enhancement equal to the amount of habitat suitable for the recovery of the Guam rail that is impacted. Forest enhancement would include:

- ▮ Ungulate management consisting of exclusion fencing and active control (i.e. trapping, snaring, shooting) with the goal of eradication within the fenced areas.
- ▮ Non-native, invasive vegetation removal.
- ▮ Propagation, planting, and establishment of dominant and rare species that are characteristic of native limestone forest habitats (e.g., *A. mariannensis*, *G. mariannae*, *F. prolixa*, *M. citrifolia*, *C. micronesica*, *W. elliptica*, *S. nelsonii*, *H. longipetiolata*, *T. rotensis*).

Forest enhancement would support natural regeneration and seed propagation, reduce erosion, and increase water retention (i.e., reduces fire risk).

Prior to the 2010 BO being signed, DON funded the development of Phase I of the biosecurity plan (Refer to Section 2.4.1). As part of the implementation of the 2010 BO conservation measures, DON funded Phase II of the biosecurity plan. The overall purpose of the plan is to develop a more concerted



effort to managing existing and future invasive species management in Micronesia and Hawaii. The development of this plan will benefit the Mariana fruit bat on Guam and the other islands on which it is found by providing a platform for coordination and integration of inter-agency invasive species management efforts such as control, interdiction, eradication and research.

The DON conservation measures are intended to support re-introduction of native endangered or threatened species on DoD lands on Guam consistent with species recovery plans. In further support of such recovery efforts, the DON intends to actively participate in recovery committees for endangered or threatened species on Guam. When the DON and USFWS mutually agree the constraints to reintroduction of native threatened or endangered species on DoD lands on Guam have been minimized to a point that a feasible and successful re-introduction of the affected species is more probable than not, the DON will work with the USFWS to develop a re-introduction plan and supporting programmatic biological opinion that ensures such re-introduction efforts are consistent with the species recovery plans and the military mission on Guam.

4.7 Potential Effects to Sea Turtles

Species

Construction and Operations

The green and hawksbill sea turtles potentially nest along the Haputo ERA beach and Tarague Beach. Two suspected nest attempts by green sea turtles have been observed at Haputo Beach between 2008 and 2010, with no observations of nest attempts during 51 surveys from 2010 to 2012 (Grimm and Farley 2008; NAVFAC Marianas 2011; Brindock 2012). All cantonment/family housing components would be constructed on the upper plateau area of Finegayan and would not occur in the Haputo ERA. Use of Haputo and Tarague Beach is not expected to increase as a result of construction activities; therefore, there would be no impacts from construction personnel to sea turtles that may occur on the Haputo or Tarague Beach. Construction personnel are issued base passes for official business only within proposed construction areas; these restrictions are specified in construction contracts.

To avoid and minimize any potential impacts to nesting sea turtles from proposed facility lighting associated with the construction of the cantonment/family housing area at Finegayan, hooded lights would be used to the maximum extent practicable at all new roads and facilities near coastline areas. Illumination of coastline areas would be kept to an absolute minimum.

Green sea turtle nesting is documented on the Guam NWR north of the proposed impacted areas. The hawksbill sea turtle has not been definitively determined to nest on Guam (JRM 2013). There are no sea turtle nesting beaches within proposed impacted areas associated with LFTRC. No explosive projectiles are proposed for use and all projectiles are expected to be contained within the range footprint by bullet traps or backstops, with the exception of ricochets, which would be contained within the SDZs, according to statistical analysis provided in the 2010 Final EIS. Signage as well as lighting (blinking red lights) would notify people in the area that the ranges are in use. However, the design of the signage and lighting would be designed to insure minimal to negligible impacts on sea turtles.

Enforcement of the BMP regarding free-roaming pets would prevent potential impacts to nesting sea turtles from harassment, injury or mortality from pets.

The implementation of the forest enhancement measures would also benefit the survival of sea turtles (e.g., reducing erosion, reducing nest predation by rodents). In particular, the objectives of ungulate

management, control/suppression of invasive plants, and outplanting of native species proposed would benefit the two species.

Potential impacts to sea turtles were evaluated for a similar, but larger proposed action in the 2010 Final EIS (Volume 2, Chapter 10: Terrestrial Biological Resources, Section 10.2.2.1: North, NCTS and South Finegayan, page 10-118), and were found to “may affect but not likely to adversely affect the species” and would continue to not likely adversely affect the species.

Critical Habitat

There is no terrestrial critical habitat designated for the green or hawksbill sea turtle.

Recovery Habitat

The 2010 BO did not include recovery habitat for the green or hawksbill sea turtle and we are not aware of any subsequent recovery habitat criteria being developed.

4.8 Potential Effects to the Mariana eight-spot butterfly

Species

Construction and Operations

Host plants and adult, immature, and egg stages of the eight-spot butterfly have been observed within the Proposed Action (NAVFAC Marianas 2013; NAVFAC Pacific 2013b). As part of the BMPs, to avoid and minimize potential impacts to Mariana eight-spot butterflies (e.g., pre-construction butterfly and host plant surveys and salvage/relocation of host plants, larvae or eggs), there may be an effect but it is not likely to adversely affect the Mariana eight-spot butterfly.

Some species of tropical butterflies have well-developed ears on their wings and can detect sounds at the same frequencies that humans can hear. It is hypothesized that the butterflies are listening to the flight sounds or foraging calls of predatory birds (Lane *et al.* 2008; Yack 2012). Given the low numbers of forest birds currently on Guam due to the brown treesnake, masking of the flight sounds or foraging calls of predatory birds due to noise from proposed construction activities would not make eight-spot butterflies more susceptible to predation.

There are currently neither projected dates for reintroduction of the forest birds on Guam, nor successful suppression of the brown treesnake to a level which would support re-introduction. Until the forest birds are successfully re-introduced and then the butterfly has the potential to be exposed to the masking of flight sounds or foraging calls of predatory birds due to construction and operational activities we cannot determine an effect to the species. If forest birds are reintroduced into the areas of the Proposed Action, the DON would reinitiate consultation to address these issues.

In addition, the forest enhancement measures mentioned above, would also benefit the survival the Mariana eight-spot butterfly. In particular, the objectives of ungulate management, control/suppression of invasive plants, and outplanting of native species, including eight-spot butterfly host plants.

Critical Habitat

There is no critical habitat designated for the Mariana eight-spot butterfly.

Recovery Habitat

The 2010 BO did not include recovery habitat for the Mariana eight-spot butterfly and we are not aware of any subsequent recovery habitat criteria being developed.

4.9 Potential Effects to *Tabernaemontana rotensis*

Species

Construction and Operations

Two clusters of *T. rotensis* are located within the eastern portion of the potential water well development impacted area on AAFB. All *T. rotensis* would be avoided to the maximum extent practicable during proposed construction activities. As part of the BMPs, high-value (both biologically and culturally) plant species, such as *T. rotensis* saplings would be salvaged to the maximum extent practicable during construction activities and translocated to suitable habitat.

Although fire potential could increase due to proposed live-fire range operations, with implementation of the proposed Range Fire Management Plan, potential impacts from range-related wildfires on *T. rotensis* may affect but it is not likely to adversely affect the *T. rotensis*.

Given that 265 clusters of *T. rotensis* have been documented on AAFB (UoG 2007) and only 2 clusters of plants have been observed within proposed impacted areas, the loss of 2 clusters of plants would be discountable. The implementation of the previously mentioned BMPs (e.g., avoidance, or salvage and translocation and implementation of the Range Fire Management Plan), there may be an affect but it is not likely to adversely affect *T. rotensis*. with implementation of the proposed construction and operational activities.

In addition, the forest enhancement measures mentioned above, would also benefit the survival *T. rotensis*. In particular, the objectives of ungulate management, control/suppression of invasive plants, and outplanting of native species, including *T. rotensis*.

There may be an effect but it is not likely to adversely affect the Mariana eight-spot butterfly.

Critical Habitat

There is no critical habitat designated for the *Tabernaemontana rotensis*.

Recovery Habitat

The 2010 BO did not include recovery habitat for the *T. rotensis* and we are not aware of any subsequent recovery habitat criteria being developed.

4.10 Potential Effects to *Cycas micronesica*

Species

Construction and Operations

All *C. micronesica* would be avoided to the maximum extent practicable during proposed construction activities. As part of the BMPs, high-value (both biologically and culturally) plant species, such as *C. micronesica* would be salvaged to the maximum extent practicable during construction activities and translocated to suitable habitat.

Although fire potential could increase due to proposed live-fire range operations, with implementation of the proposed Range Fire Management Plan, potential impacts from range-related wildfires on *C. micronesica* may affect but it is not likely to adversely affect the *T. rotensis*.

The implementation of the previously mentioned BMPs (e.g., avoidance, or salvage and translocation and implementation of the Range Fire Management Plan), there may be an affect but it is not likely to

adversely affect *C. micronesica* with implementation of the proposed construction and operational activities.

In addition, the forest enhancement measures mentioned above, would also benefit the survival *C. micronesica*. In particular, the objectives of ungulate management, control/suppression of invasive plants, and outplanting of native species, including *C. micronesica*.

There may be an effect but it is not likely to adversely affect the Mariana eight-spot butterfly.

Critical Habitat

There is no critical habitat designated for the *C. micronesica*.

Recovery Habitat

The 2010 BO did not include recovery habitat for the *C. micronesica* and we are not aware of any subsequent recovery habitat criteria being developed.

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CHAPTER 5

CUMULATIVE EFFECTS ANALYSIS

"Cumulative effects" under the ESA are those effects of *future* State or private activities, *not* involving federal activities, that are reasonably certain to occur within the Action Area of the federal action subject to consultation [50 CFR 402.02].

The future state or private activities that are reasonably certain to occur in the action areas include the following:

- Commercial and recreational fishing
- Tourism
- Commercial shipping
- Private development
- Natural resources management

Implementing the Proposed Action in conjunction with other past, current, and future activities could affect terrestrial biological resources within the action areas. Several ongoing or successional activities can contribute cumulatively to habitat degradation, including disturbance to soils and vegetation, spread of invasive non-native species, an increase in erosion and sedimentation, and impacts on native plant and animal species. Additionally, the development of Guam over the next few years on non-DoD lands may increase pressure on terrestrial habitats within DoD lands and development on DoD lands may increase pressure on terrestrial habitats on non-DoD lands. Although individual effects may be less than significant, collectively they have the potential to be cumulatively significant over time. Potential cumulative effects are difficult to foresee.

A discussion of the cumulative impacts of other federal projects within the action areas can be found in the draft 2014 SEIS.

CHAPTER 6

CONCLUSION

The DON has made the determination that the Proposed Action is likely to adversely affect the Mariana fruit bat and its associated habitat. The Proposed Action is likely to adversely affect the habitat for the Mariana crow, Guam rail and Guam Micronesian kingfisher. A “may affect, not likely to adversely affect” determination has been made for the Green sea turtle, Hawksbill sea turtle, *Serianthes nelsonii*, Mariana eight-spot butterfly, *Tabernaemontana rotensis*, and *Cycas micronesica* (Table 6-1).

Table 6-1. Threatened and endangered species addressed in this Biological Opinion and their Affects Determinations

Common Name	Scientific Name	ESA Status	Affects Determination
Mariana fruit bat	<i>Pteropus mariannus mariannus</i>	Threatened	Likely to Adversely Affect
Mariana crow	<i>Corvus kubaryi</i>	Endangered	Likely to Adversely Affect (habitat only)
Guam rail	<i>Gallirallus owstoni</i>	Endangered	Likely to Adversely Affect (habitat only)
Guam Micronesian kingfisher	<i>Todiramphus [=Halcyon] cinnamominus cinnamominus</i>	Endangered	Likely to Adversely Affect (habitat only)
Green sea turtle	<i>Chelonia mydas</i>	Threatened	May Affect, Not Likely to Adversely Affect
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered	May Affect, Not Likely to Adversely Affect
Hayun lagu	<i>Serianthes nelsonii</i>	Endangered	May Affect, Not Likely to Adversely Affect
Mariana eight-spot butterfly	<i>Hypolimnast octocula mariannensis</i>	Proposed?	May Affect, Not Likely to Adversely Affect
	<i>Tabernaemontana rotensis</i>	Proposed?	May Affect, Not Likely to Adversely Affect
	<i>Cycas micronesica</i>	Proposed?	May Affect, Not Likely to Adversely Affect

The Proposed Action is likely to adversely affect the Mariana fruit bat, Mariana crow, Guam rail, and Guam Micronesian kingfisher on Guam although this loss will not preclude the recovery or survival of these species. The DON has proposed several conservation actions to benefit these species and BMPs to proactively reduce, minimize, or avoid impacts.

The BMPs will be implemented as appropriate for the individual construction projects. For example, HACCP plans will be required for all projects involving the shipment of materials, supplies or equipment to Guam however, only projects adjacent to recovery habitat will require monitoring to evaluate effectiveness of HACCP.

Implementation of the Conservation Measures will be based on the implementation of the action that results in an impact to recovery habitat. Table 6-2 identifies the elements of the Proposed Action that will result in impact to recovery habitat. Appendix C is an expanded version of the table that details the various projects covered under the larger Proposed Action categories. As mentioned in Chapter 2, the Proposed Action involves horizontal construction work (U&SI). Once the U&SI work is initiated, a commensurate amount of forest enhancement would begin. If the associated vertical construction was never constructed, the forest enhancement would still be conducted as the impact to the resource resulted from the U&SI project.

Conservation Measures such as the Regional Biosecurity Plan (Micronesia Biosecurity Plan), Brown Treesnake Research and Suppression, Brown Treesnake Interdiction at the commercial ports have already been initiated as part of the 2010 BO and will continue until completed as specified in Section 2.4. The fencing and installation of education signage would be initiated prior to the arrival of the Marine Corps population on Guam. DON has developed the material for the sea turtle outreach and will distribute the activity booklets, posters and tri-fold brochures when the Marine Corps population arrives on Guam. The bracing of the *Serianthes* would be initiated during the construction of the NWF LFTRC KD ranges.

Table 6-2 Proposed Action and associated impacts to Recovery Habitat

FEIS 2010 ROD Related Actions and DSEIS 2014 Project Areas				
Project Name	Serianthes nelsonii Recovery Habitat (Ac)	Mariana Crow Recovery Habitat (Ac)	Guam Rail Recovery Habitat (Ac)	Mariana Fruit Bat & Guam Micronesian Kingsfisher Recovery Habitat (Ac)
FEIS 2010 ROD Related Actions	48.38	75.58	422.20	71.82
Cantonment U&SI Phase I	334.52	336.95	192.73	336.95
Cantonment U&SI Phase II	106.84	106.80	66.34	106.80
Family Housing U&SI	0.00	304.77	47.34	304.77
Information Technology/Communications	34.60	39.76	117.23	39.00
Electrical, Wastewater, and Water Off Site Utilities	2.99	5.04	27.83	4.28
Water Well Development Area	79.47	79.47	10.22	79.47
Live Fire Training Range Complex - MPMG	62.63	80.50	27.05	80.50
Live Fire Training Range Complex - KD Ranges	115.99	134.78	45.96	134.04
Live Fire Training Range Complex - USFWS Relocation	2.88	12.51	0.00	12.52
Stand Alone Hand Grenade	0.00	0.00	21.51	0.00
AAFB - Expand Middle School	0.00	0.00	0.00	0.00
Guam High School Expansion	0.00	0.00	2.08	0.00
Recycle Center	4.80	4.80	0.24	4.80
9th ESB (-)	16.82	16.82	0.00	16.82
9th ESB HQ	2.58	2.58	0.00	2.58
MC&FH Finegayan Blue Box Area Outside U&SI Projects	113.95	121.36	119.97	121.36
TOTAL RECOVERY HABITAT IMPACT - FEIS 2010 ROD Related Actions and DSEIS 2014 Project Footprints	897	1280	999	1276

Data Sources: MC&FH Finegayan CDP (12/19/2013); LFTRC Northwest Field CDP (11/27/13); Guam Rainbow Chart 3/17/2014

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CHAPTER 7

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COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

36WGI32-7004

BY ORDER OF THE COMMANDER, 36TH WING

36 WG INSTRUCTION 32-7004

DATE: 15 March 2006

Civil Engineering

BROWN TREE SNAKE MANAGEMENT

OPR: 36 CES/CES (Jonathan Wald)

Certified by: 36 CES/DCE (Merlin J. Miller)

Pages: 16/Distribution: F

This instruction implements the *Brown Tree Snake Control Plan* prepared under the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, the *Brown Tree Snake (BTS) Control and Interdiction Plan (COMNAVMARIANAS INSTRUCTION 5090.10)* dated June 2000, and the *Brown Tree Snake Control and Eradication Act of 2004* (Public Law 108-384, 108th Congress). The purpose of this instruction is to establish procedures and guidelines to prevent the spread of Brown Tree Snake (BTS) to areas where it is not already established via the AAFB transportation network. It outlines the procedures for cooperative interagency efforts to control and interdict BTS, including Department of Defense (DoD) coordination, support, and documentation of inspections of outgoing aircraft and cargo by United States Department of Agriculture Wildlife Services (USDA WS) personnel. This instruction applies to all personnel assigned, attached, or associated with the 36th Wing (36 WG), its tenant units, and contractors. This publication also applies to US Air Force Reserve and Air National Guard units and other organizations/tenants associated with or residing on Andersen AFB.

Chapter 1

PROGRAM REQUIREMENTS

1.1. Purpose of Program. Brown Tree Snake (BTS) control and interdiction efforts on Andersen are aimed at reducing the risk of dispersal of the BTS, an invasive species causing extensive damage to Guam's ecology, from Guam via the base's transportation network, as well as addressing ongoing and potential BTS threats to biological resources and human health and safety.

1.2. General Roles and Responsibilities. A Memorandum of Agreement, signed by the United States Departments of Defense, Interior, Agriculture, and Transportation, as well as the State of Hawaii, the Government of Guam, and the Commonwealth of the Northern Marianas Islands,



DEPARTMENT OF THE NAVY
COMMANDER, U.S. NAVAL FORCES MARIANAS
PSC 455, BOX 152
FPO AP 96540-1000

IN REPLY REFER TO:

COMNAVMARIANASINST 5090.10A
N45
14 FEB 2005

COMNAVMARIANAS INSTRUCTION 5090.10A

Subj: BROWN TREE SNAKE CONTROL AND INTERDICTION PLAN

Ref. (a) Executive Order 13112, Invasive Species
(b) OPNAVINST 5090.1B
(c) COMNAVMARIANASINST 3500.4

Encl: (1) Brown Tree Snake Control and Interdiction Plan

1. Purpose. To outline specific responsibilities and establish policy for coordination and procedures governing the control and interdiction of brown tree snakes on Navy installations on Guam and during military training within the Commander, U.S. Naval Forces Marianas (COMNAVMARIANAS) Area of Responsibility (AOR).

2. Cancellation. COMNAVMARIANASINST 5090.10. This instruction has been changed in its entirety.

3. Scope. This instruction provides guidance and direction to prevent the dispersal of brown tree snakes from Guam to other locales via military sea and air shipments of personnel, equipment, and cargo. Its provisions are applicable to all activities in the COMNAVMARIANAS AOR who directly or indirectly have responsibility for military sea and air shipments. This instruction issues a revised Brown Tree Snake Control and Interdiction Plan that is to be followed during the planning and execution of any movement of military sea and air shipments, including personnel. This instruction applies to Guam Installation Commanders, Major Exercise Commanders, Training Unit Commanders, and all military Flight Crews.

4. Background. Per reference (a), COMNAVMARIANAS is responsible for not causing or promoting the introduction or spread of invasive species in the United States or elsewhere. The brown tree snake is an alien species to the United States, including Guam, whose introduction has caused significant economic and environmental harm; consequently, it is classified as an invasive species. Per reference (b), the Navy is required to ensure military readiness and sustainability while complying with natural resources protection laws, and conserving and managing natural resources in the United States, its territories, and possessions. This dual dynamic of stewardship and readiness is essential for the long-term maintenance of

14 FEB 2005

military and natural resources sustainability. Per reference (c), COMNAVMARIANAS is the controlling and scheduling authority for Navy-owned and controlled training areas and services in the Mariana Islands. The dispersal of brown tree snakes from Guam to other locales is a serious economic and environmental threat. Preventing dispersal of brown tree snakes in military sea and air cargo is a priority for COMNAVMARIANAS.

5. Action

a. The sponsoring office for this order, the Assistant Chief of Staff, Facilities and Environmental (ACOS N4) is responsible for environmental oversight of all actions, including military training, within the COMNAVMARIANAS AOR. The ACOS N4 is responsible for environmental evaluation of potential environmental impacts, determining the measures necessary to protect the environment and preserving the long-term maintenance of military and natural resources sustainability. The ACOS N4 will advise the Commander of any changes in the handling and movement of military sea and air shipment cargo, and any changes in military training constraints necessary to prevent the dispersal of brown tree snakes in military sea and air shipments. The ACOS N4 will work in close coordination with the Assistant Chief of Staff, Operations (ACOS N3).

b. The ACOS N3 is responsible for scheduling and oversight of supplies and port services and operations, and for the scheduling and oversight of training. The ACOS N3 will accomplish all specified requirements described herein.

c. The Assistant Chief of Staff, Ordnance Operations (ACOS N2) is responsible for preparing and staging munitions for shipment from Guam. The ACOS N2 will accomplish all specified requirements described herein.

d. Regional supported activities, including but not limited to, DRMO Guam, NMCB DET Guam, and MSCO Guam will:

(1) Review the Brown Tree Snake Control and Interdiction Plan and identify and incorporate into local plans all necessary control and interdiction measures, and fully cooperate with federal authorities during observations and inspections of equipment and cargo being prepared and staged for shipment from Guam.

(2) Ensure that personnel assigned to preparation and handling of equipment and cargo scheduled for shipment from Guam are knowledgeable and adhere to the information contained in the

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Brown Tree Snake Control and Interdiction Plan and directives pertaining to inspection of outbound equipment and cargo.

(3) Comply with the mandatory regulations and direction contained in the Brown Tree Snake Control and Interdiction Plan when preparing equipment and cargo for shipment from Guam.

e. Commanding Officers/Officers-in-Charge of training units will:


(1) Review the Brown Tree Snake Control and Interdiction Plan and identify and incorporate into training plans all necessary control and interdiction measures, and fully cooperate with federal authorities during observations and inspections of equipment and cargo being prepared and staged for shipment from Guam.

(2) Ensure that personnel assigned to preparation and handling of equipment and cargo scheduled for shipment from Guam are knowledgeable and adhere to the information contained in the Brown Tree Snake Control and Interdiction Plan and directives pertaining to inspection of outbound equipment and cargo.

(3) Comply with the mandatory regulations and direction contained in the Brown Tree Snake Control and Interdiction Plan when preparing equipment and cargo for shipment from Guam.

6. Applicability. This order applies to all commands, organizations, units, and activities authorized use of Navy lands and facilities, training areas, and ranges controlled by COMNAVMARIANAS.

7. Certification. Reviewed and approved this date.



R. A. McNAUGHT
Chief of Staff

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BROWN TREE SNAKE CONTROL AND INTERDICTION PLAN

**Prepared by:
Commander U.S. Naval Forces Marianas
Facilities & Environment, N45**

August 2004

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COMNAVMARIANAS
BTS CONTROL AND INTERDICTION PLAN

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ACRONYMS and ABBREVIATIONS

AAFB	Andersen Air Force Base
AMSS	AAFB Mobility Support Squadron
APHIS	Animal and Plant Health Inspection Service
BTS	Brown Tree Snake
CECG	Combined Exercise Command Group
CESG	Combined Exercise Support Group
CNMI	Commonwealth of the Northern Mariana Islands
COMNAVMARIANAS	Commander, Naval Forces Marianas
GDAWR	Guam Division of Aquatic and Wildlife Resources
DLNR	Department of Land and Natural Resources
DOD	U.S. Department of Defense
DOI	U.S. Department of Interior
FISC	Fleet Industrial Supply Center
GovGuam	Government of Guam
HDOA	Hawaii Department of Agriculture
MI	Military Inspector
MILVAN	Military (cargo) Van
MOA	Memorandum of Agreement
PHNSY	Pearl Harbor Naval Shipyard
PM	Pest Management (USAF)
PMRF	Pacific Missile Range Facility
USAF	United States Air Force
USAG-HI	United States Army Garrison, Hawaii
USARPAC	United States Army, Pacific
USCOMPAC	Commander, U.S. Pacific Command
USCOMPAC REP	USCOMPAC Representative
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS/CSU	U.S. Geological Survey/Colorado State University, Brown Treesnake Project
USGS/RRT	U.S. Geological Survey, Rapid Response Team
WACSA	USDA-WS Approved Cargo Staging Area
WS	(USDA) Wildlife Services

BROWN TREE SNAKE CONTROL AND INTERDICTION PLAN

I. INTRODUCTION

Purpose

Control and interdiction of the brown tree snake (*Boiga irregularis*), hereafter referred to as BTS, is absolutely essential to prevent the dispersal of BTS from Guam to other locales via military sea and air shipments of personnel, equipment and cargo. The control and interdiction protocols are practiced on a daily basis by military organizations permanently stationed in Guam. The purpose of this plan is to disseminate these procedures to resident and transient organizations, and to emphasize the threat and need to prevent BTS movement from Guam to other areas at risk during military training activities. These preventive practices are particularly crucial during shipments to the Commonwealth of the Northern Mariana Islands (CNMI), Hawaii, and other locations where the BTS has no natural population controls. Therefore, the primary objectives of BTS control and interdiction are to reduce the ongoing and potential threats to human health and safety, biological resources, and impacts to island economies.

The Brown Tree Snake Threat

The BTS is a native species of Indonesia, New Guinea, the Solomon Islands, and Australia that was inadvertently introduced in Guam sometime between the mid-1940s and early 1950s. Since its introduction, the population of BTS has expanded to encompass the entire island's rural and urban areas. The BTS has caused or has been a major factor in the extirpation of most of Guam's native terrestrial vertebrates, including lizards and 9 of 11 endemic/native forest and water birds. In addition, the BTS has caused more than a thousand power outages, preyed on poultry and household pets, and has bitten numerous children.

High densities of snakes occur throughout Guam, and in areas where cargo is loaded for transport by air and sea. BTS characteristics such as being able to survive for long periods of time without food, and habitually seeking out small dark places as refugia, work synergistically to give a higher probability for successfully transporting BTS to other islands/regions. Due to the possibility of sperm storage, a single female BTS can potentially start a population. The potential spread of BTS from Guam via cargo movements is a serious concern due to Guam's role as a trans-Pacific shipping hub and the delicate environments of islands that receive cargo.¹ BTS sightings have been recorded in locations ranging from - Oahu in Hawaii, Tinian, Rota, and Saipan in the CNMI, Marshall Islands, Okinawa, Diego Garcia, Wake Island, Spain, Alaska and Texas. There is no documentation supporting any established populations of BTS in any of these locations. However, detecting BTS populations at low densities is extremely difficult.

¹ USDA et al.1996. *Environmental Assessment for Brown Tree Snake Control Activities on Guam*.

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II. FEDERAL AUTHORITY AND DIRECTION

1990: Federal funding for BTS interdiction and control initiated.

1990: U.S. Congress incorporated specific direction into the Nonindigenous Aquatic Nuisance Prevention and Control Act regarding the control of BTS in coordination with regional, territorial, state, and local entities in Guam and other areas where the species is established outside of its historic range.

1993: A 5 year Memorandum of Agreement (MOA) between U.S. Department of Agriculture (USDA)², the U.S. Department of the Interior (DOI), the U.S. Department of Defense (DOD), the Government of Guam (GovGuam) and the State of Hawaii to coordinate BTS research and establish the USDA Animal Damage Control program.

1996: The Commonwealth of the Northern Mariana Islands (CNMI) added to the 5 year MOA.

1999: Department of Transportation and the Department of Commerce added to 5 year MOA.

1999: President Clinton signed Executive Order 13112, "Invasive Species"³. The executive order directed federal agencies to (1) prevent, detect, and respond to control populations of invasive species; (2) to monitor invasive species populations; (3) to provide for restoration of native species and habitation in ecosystems that have been invaded; (4) to conduct research and develop technologies to prevent introduction and to control invasive species; and, (5) to promote public education on invasive species.

III. DOD BTS ACTIONS IN THE MARIANA ISLANDS

BTS contamination can occur during any cargo shipment or personnel scenario. COMNAVMARIANAS and Commanding Officer, 36th Air Base Wing, Andersen Air Force Base, are responsible for carrying out a viable plan to meet a full spectrum of potential BTS cargo contamination at Guam's military ports. COMNAVMARIANAS and 36th ABW are fully supported in these actions by the USDA Wildlife Services (WS).

Other cooperative agencies that support COMNAVMARIANAS and 36th ABW BTS control and interdiction efforts include DOI, U.S. Fish and Wildlife Service (USFWS), the U.S. Geological Survey/Colorado State University Brown Treesnake Project (USGS/CSU), the Guam Department of Agriculture's Division of Aquatic and Wildlife Resources (GDAWR), the CNMI Department of Land and Natural Resources (DLNR), and the State of Hawaii Department of Agriculture (HDOA).

² In 1997, USDA Animal Damage Control (ADC) became the USDA Animal and Plant Health Inspection Services (APHIS) Wildlife Services (WS), and is the office presently responsible for integrated wildlife damage management.

³ "Invasive species" means a species not native to an ecosystem that does or is likely to cause economic or environmental harm or harm to human health.

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The COMNAVMARIANAS BTS Control and Interdiction Plan has been implemented and evaluated during major inter-island exercises, as well as numerous small scale operations and daily operations. The control and interdiction procedures were reevaluated as part of a Commander, U.S. Pacific Command (USCOMPAC) Final Environmental Impact Statement that assessed potential impacts of all military training exercises throughout the Mariana Islands. The lessons learned from these major exercises and the results of other environmental evaluations have been incorporated in this plan. COMNAVMARIANAS sponsors annual reviews of BTS control and interdiction protocols with federal, territorial and commonwealth agencies to evaluate additional lessons learned and new technologies that may be adopted in the Mariana Islands.

IV. RESPONSIBILITIES

The following categorized responsibilities provide a foundation for action by certain agencies or individuals involved with Guam military training exercises and BTS control/interdiction programs. Due to turnover experienced by all military units, the responsibilities relating to BTS threat awareness instruction will often be repetitious to ensure that all persons training in the Mariana Islands are fully knowledgeable of individual and command responsibilities.

A. Guam Installation Commanders

COMNAVMARIANAS and Commander, 36th Air Base Wing are responsible for the conduct of BTS control and interdiction on Navy and USAF installations, respectively, and supported daily by the Guam WS permanent staff assigned to COMNAVMARIANAS and Andersen Air Force Base. The installation commanders are responsible to keep WS informed of activities that will require their support. Specific command responsibilities are as follows:

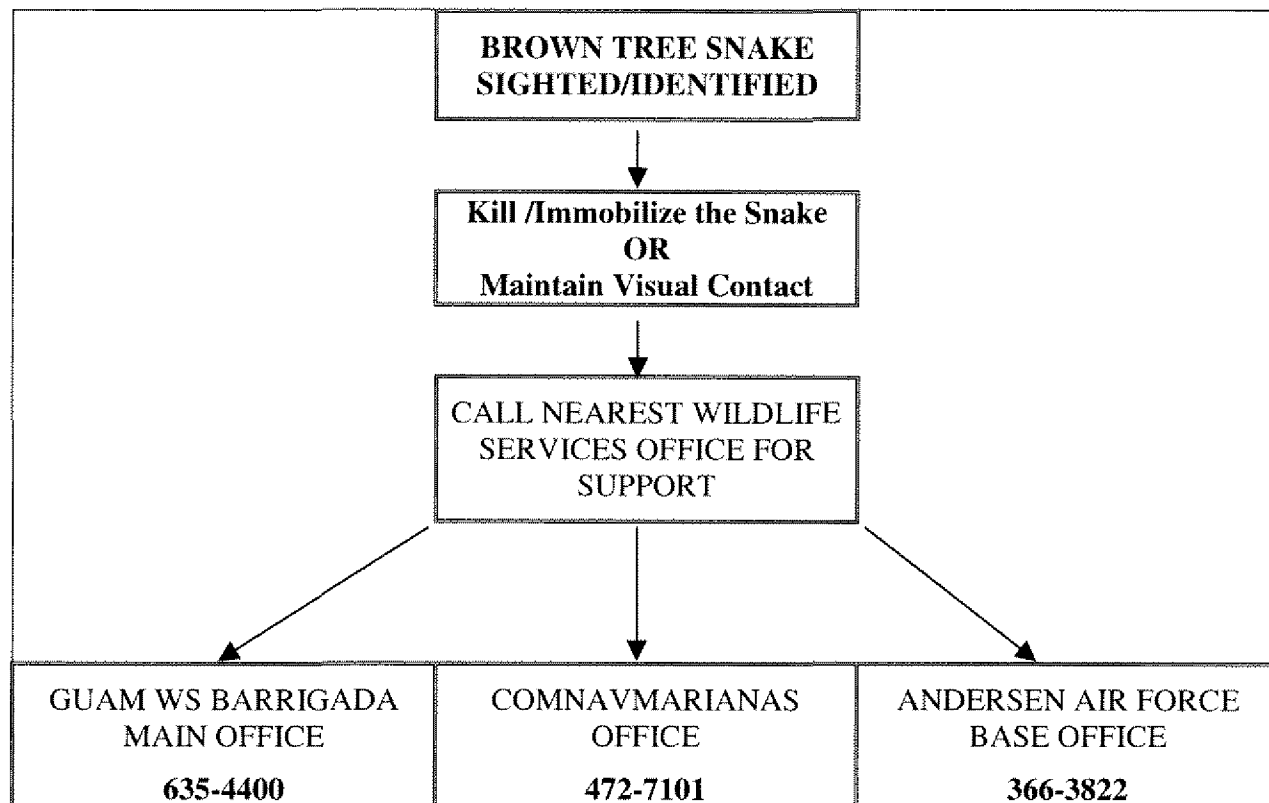
1. Fully cooperate with WS to conduct measures necessary to reduce the BTS snake population at port and cargo facilities through an integrated approach consisting of technical assistance and lethal and non-lethal control methods such as exclusion, habitat modification, capture and prey base reduction.
2. Plan, direct, and coordinate all cargo handling procedures for cargo departing Guam with consideration for the on-going threat of the pan-Pacific spread of BTS.
3. Consult with WS to determine the necessity to establish USDA-WS approved cargo staging areas (WACSA).
4. Direct cargo handlers and/or managers to work closely with WS personnel to establish and maintain an effective cargo and equipment BTS inspection process.
5. Publish and distribute the BTS Emergency Response Protocol. Prominently display contact information and telephone numbers to report BTS sightings (see Table 1).

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6. Conduct information briefings for both permanently assigned and transient personnel. Explain the potential for impacts if BTS were transported from Guam in military vehicles, cargo and equipment. Explain individual responsibilities if and when a BTS or any other snake species is sighted (kill/capture/immediately report to WS). Other snake species can be dangerous.
7. Clearly display BTS identification and information posters in tent cities, barracks and work sites. Use the BTS Awareness instructional videotapes and printed materials, requesting WS participation and/or demonstrations at the briefings when their workloads permit. Provide information cards to personnel as a reminder of the BTS threat and responsibilities for immediate action.
8. For major exercises, include BTS control and interdiction procedures in the exercise plan's Environmental Awareness Annex. Include in the annex, a copy of the information cards to be distributed to training personnel that will define applicable environmental protective measures, including the BTS protocol.
9. In consultation with WS, direct the sites to be used for tent cities and staging areas for vehicle, cargo pallets and containers, and other equipment.
10. Provide vehicle washing areas and high-pressure wash equipment when needed.
11. Designate areas to be used for inspecting vehicles after they have been cleaned and prior to movement to WACSA or immediate loading aboard aircraft and/or ships.
12. Provide area lighting at WS approved designated inspection and staging areas.
13. Assist WS to facilitate the mandatory 100 percent inspection of all outbound cargo by detector dog teams.
14. For major exercises, assign members of the base environmental staff with experience in conducting BTS protocol as members of the Combined Exercise Command Group (CECG) and the Combined Exercise Support Group (CESG).
15. Provide personnel and logistic support to augment BTS protocol activities as needed.
16. For major exercises and in coordination with WS, enhance rodent control measures and grounds maintenance practices that reduce the potential for BTS activity/presence in areas selected for vehicle and cargo staging.
17. During day-to-day cargo inspections, the installation commander may authorize WS to stop any cargo carrier from departing Guam with any cargo or equipment suspected to harbor BTS.

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Table 1: BTS Emergency Response Procedures for Guam Cargo Stations



NOTE: Cellular phone numbers will be provided to exercise units during field exercises to ensure WS can be contacted at any hour.

B. Major Exercise Commanders

The CECG and CESG conducting major exercises are tasked with a variety of responsibilities to support the exercise force. Logistics coordination in response to command direction is the responsibility of the CESG. Early coordination with WS is required to incorporate BTS control and interdiction requirements into the exercise logistic support plans. In regard to BTS control and interdiction, the CECG/CESG will:

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1. Work with the Installation Commander and WS when necessary to establish a WACSA for personal and unit equipment, and vehicle staging.
2. Work with the AAFB commander and WS to develop an aircraft parking plan that will minimize potential exposure of aircraft to BTS.
3. Supervise the BTS control and interdiction process by providing environmental monitors as needed.
4. Schedule and monitor BTS control and interdiction briefings for all training units upon arrival.
5. Identify to WS the logistics staff personnel who will be responsible for cargo handling operations and BTS response.
6. Provide WS the authority to stop any cargo carrier from departing Guam with any cargo or equipment suspected to harbor BTS.

C. Training Unit Commanders

Regardless of the size of training exercises, commanders of resident and transient organizations will request support from the Installation Commander (and/or the CECG and CESC) when tasked with establishing tent cities, staging areas, and areas for inspecting personnel, vehicles and cargo prior to shipment from Guam (see Section E below for a listing of WS assistance and service that are provided to training units). The commanders of training units will:

1. Ensure that installation staff or CESC conduct BTS control and interdiction information briefings for exercise personnel.
2. Distribute BTS information packets that include the Emergency Response Protocols in case of actual or suspected snake sightings.
3. Coordinate with the on-site commanders to obtain wash down facilities and inspection areas. 36th ABW may provide portable high-pressure washers and a cleaning area. Future plans include repair of a 36 Transportation Squadron vehicle washing area.
4. Identify key personnel responsible for cargo staging, handling and inspection to the installation commander/CESC and ensure their cooperation with WS personnel.
5. Provide additional information to cargo handlers to increase their levels of BTS awareness. Cargo handlers are the first-line of defense against BTS in military cargo. Request assistance from WS to review the following:
 - a. History of BTS on Guam, the threat to the environment, action taken to control and interdict BTS, and the goals of existing programs. (Use the USDA video).
 - b. A description of implementation efforts on base.

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- c. A demonstration by the WS detector dog team.
 - d. A live BTS to enhance immediate recognition.
 - e. A review of proper methods to kill or capture the snake.
 - f. Information cards.
6. Supervise the equipment and vehicle cleaning and inspection prior to moving items to the staging area for WS inspections.
7. Provide WS complete access to staged cargo and equipment, opening any containers as requested for a WS internal inspection.
8. Designate personnel as inspectors to assist during WS and cargo handling personnel during personnel, vehicle, cargo and equipment cleaning and inspection.
9. Ensure that all ships and aircraft departing from Guam for overseas and airports are inspected by WS.
10. Prior to breaking camp and off-island departure, ensure that personal belongings, tents and canvas used/staged in bivouac areas have been inspected for BTS presence by WS. Ensure that all personnel conduct inspections of their individual equipment (hand-carried/back-packed/sea-bags). Request WS assistance prior to breaking camp.

D. Flight Crews

Supporting aircraft may be staged at the AAFB parking apron. Supporting aircraft will not be staged overnight at Orote airfield. When idle, the doors of the aircraft will be closed so that BTS cannot enter the aircraft interior. During pre-flight inspections, flight crews should be alert for potential BTS on aircraft. Request WS assistance as needed.

E. USDA APHIS Wildlife Services Support in Guam

USDA APHIS field operations in Guam are conducted by Wildlife Services (WS) staff consisting of Wildlife Biologists, WS Specialists, and snake detector dogs. Logistic support is available to Guam from the WS staff in Yakima, Washington, who make and store equipment and snake traps.

WS BTS control and interdiction efforts are conducted at all commercial and DOD ports for day-to-day cargo shipments. In support of military exercises, WS inspection and containment efforts are enhanced, and WS will:

- 1. Conduct a 100 percent canine inspection of all outbound aircraft and surface cargo.

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2. Identify, purchase, operate, and maintain BTS control tools such as snake handling equipment, snake traps, and snake barriers. Barrier fencing is used to erect a WACSA at a port of embarkation on Guam (to keep snakes out of inspected cargo) and a containment area (to keep any snakes in) at the port of debarkation on Tinian. Other tools may be used as needed to accommodate special circumstances and situations.
3. Determine snake-trapping strategies by topographical features and proximity to cargo staging, handling, or processing areas. The BTS trap is a modified minnow trap with a mouse as an attractant within an inner chamber that is inaccessible to snakes. The trap is routinely restocked with food and moisture source for the mouse. The self-setting traps have one-way entrances on either end and are designed for multiple captures.
4. Assign WS personnel and detector dog teams 24 hours/7-days per week during deployment and post-exercise redeployment activities.
5. Use handheld spotlights to walk the perimeter at night to detect and capture BTS, and use detector dog teams to inspect shipments trucked into staging area.

To ensure effective communication with exercise participants, WS will rely on a close working relationship with military cargo managers, appropriate installation commanders, and training unit commanders, and the military commanders keeping WS informed of ongoing and future activities.

USDA WS may be contacted one of three offices on Guam: Andersen AFB Office (366-3822), Barrigada Heights District Office (635-4400), and COMNAVMARIANAS Office (472-7101). The supervisory office in Honolulu can be reached at (808) 861-8576. Cell phone numbers will be published prior to major exercises to ensure WS personnel on Guam and Tinian can be reached 24 hours a day

F. USGS/Colorado State University, Brown Treesnake Project (USGS/CSU)

The U.S. Geological Survey/CSU's Brown Treesnake Project may provide technical assistance to WS. BTS specialists in USGS/CSU may be called upon to provide technical assistance on barrier deployment and construction, trapping efficacy, population levels, special problems with visual or trap-capture of small snakes in dense vegetation, etc. The USGS-Rapid Response Team (RRT) can be requested by local government agencies to respond to any snake sightings outside of Guam.

V. CONTROL, CLEANING, AND INSPECTION PROCEDURES

The possibility of the inadvertent importation of the BTS to other areas of the world is always present whenever military units embark from Guam. BTS is a nocturnal snake that will seek shelter during the day in any area that offers shade, including CONEX boxes, MILVANS, commercial shipping containers, crates, pallets, and personal gear, as well as aboard aircraft, ships, and wheeled or tracked vehicles. The snake can hide in extremely confined spaces. The BTS has the ability to go without food for extended periods and to survive long voyages or flights undetected. Military and commercial air- and sea-ports have recorded several instances of

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a live BTS arriving from Guam. Therefore, BTS control and interdiction responsibilities have high priority.

A. BTS Control Measures at COMNAVMARIANAS and AAFB Cargo Points

WS personnel will provide support to the military on a routine basis as well as throughout any training exercises that involve the shipment of military personnel and associated cargo off-island via ship (Apra Harbor) and/or aircraft (Andersen AFB). This support is identified in Section II. D above. Ensuring that the BTS protocol is accomplished and that there are no delays in off-island shipment will require full cooperation from the units being inspected prior to embarkation.

Permanent Staging Areas. Permanent staging areas provided by COMNAVMARIANAS and 36th ABW for sea and air cargo are surrounded by chain link fencing with lighting. These areas are extensively patrolled for BTS but are **not** WS approved cargo staging areas. COMNAVMARIANAS uses Sierra Wharf and warehouse facilities at the former Fleet Industrial Supply Center (FISC). At AAFB, the primary staging area is the 634th Air Mobility Support Squadron (AMSS) warehouse (see Figure 1). Cargo is inspected at these sites daily. These facilities are primarily used for day-to-day cargo staging, but may be used for cargo related to a training exercise.

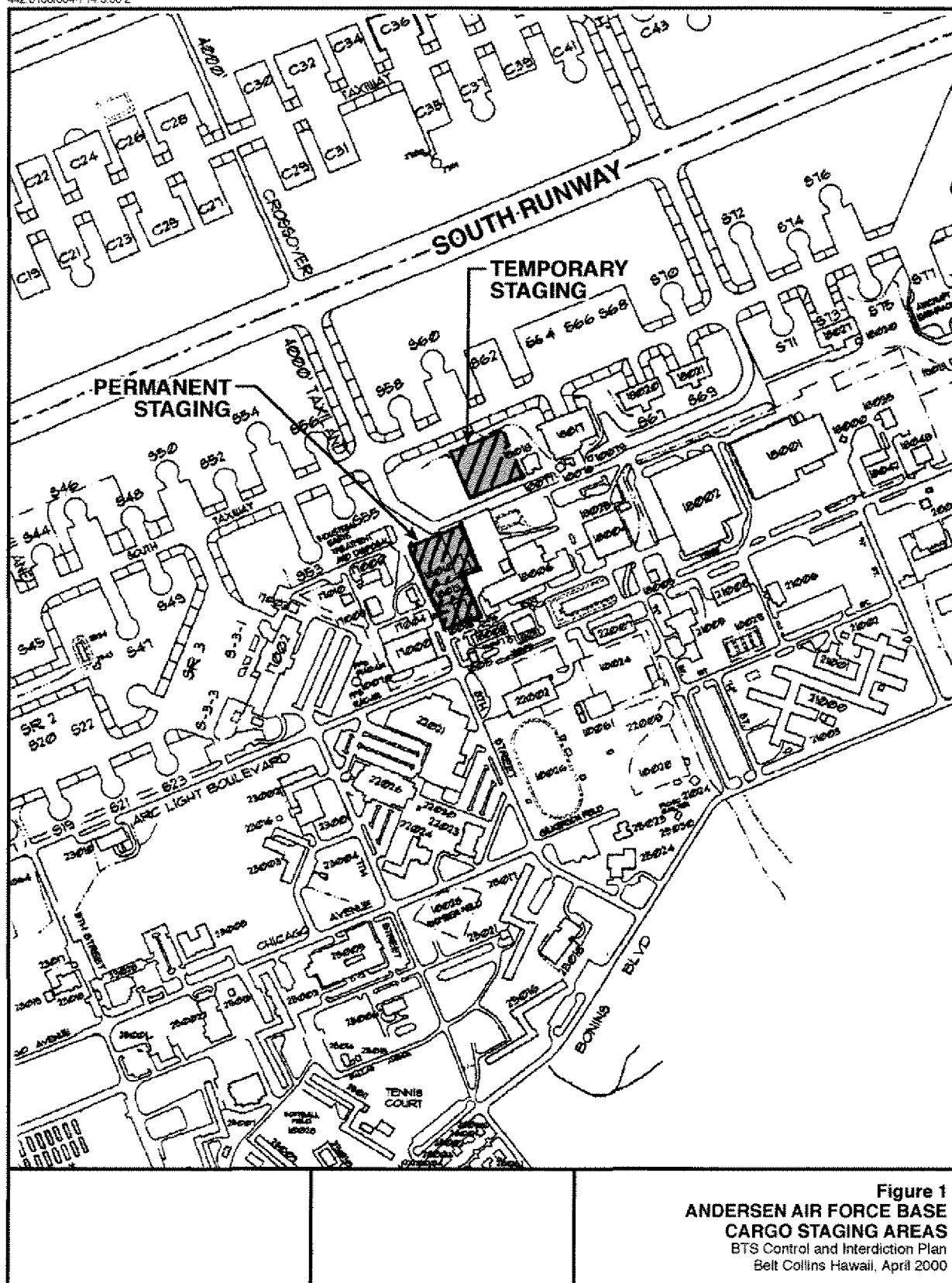
Temporary USDA-WS Approved Cargo Staging Area (WACSA). When needed to support an influx of training materials and equipment, WS will assist military personnel to select the site for a WACSA for cargo that will be embarked from Guam. In addition to establishing a WACSA at or near a permanent staging area, other paved areas could be suitable.

WACSA will be established when there will be a delay between BTS cargo inspection and movement to the loading point for aircraft or ship embarkation. The WACSA would be used to keep BTS from contaminating inspected cargo and to establish a controlled staging area for snake surveillance and trapping. The necessity to use a WACSA as part of the overall embarkation process will be reviewed during major exercise planning conferences so that the steps and additional time may be included in embarkation plans. The need to use either permanent staging areas or a WACSA at other paved surfaces with low potential for BTS presence will be determined during pre-deployment conferences with WS assistance.

The WS developed WACSA is a barrier constructed with angled sections of weather shade netting on re-bar and PVC pipe supports, weighted along the bottom edge with water snakes and sandbags. The number of entry and exit points is minimized and the barriers at the entrances are designed to lead any BTS toward a trap. The advantage of the temporary barrier is portability and a means to readily support fixed wing operations at main airfields, helicopter operations at landing zones, and ship offloads in port. A temporary snake barrier at AAFB Main or the FISC would be erected 3-5 days prior to the exercise. Snake traps will be placed on the fencing and/or along the forest perimeter. WS personnel will be responsible for trap and portable fence line maintenance, including trap cleaning and the care of mice used as an attractant.

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Snake Trapping. Snake trapping is conducted prior to construction of the WACSA on Guam. The time necessary to initiate the effort depends on the selected WACSA site and the nature of the exercise. If the WACSA will be established at AAFB Main and the FISC, snake-trapping activities are already being conducted. If an area elsewhere on Guam, such as Northwest Field, Ordnance Annex, or Orote Point is going to be used, WS will initiate snake trapping thirty days prior to the exercise. Once the WACSA is erected, WS will conduct nightly spotlight searches in the area of the fence to augment area snake trapping.

Detector Dog Teams. WS will use snake detector dogs to inspect outbound cargo and aircraft. The snake detector dog teams (one team equals one dog and handler) will be made available as necessary 24-hours a day, seven days a week.

B. BTS Control Measures at COMNAVMARIANAS and AAFB Tent Cities

Site Selection. WS will be consulted to recommend areas of low BTS risk to be considered as Tent City (bivouac) sites.

Trapping and Searching. WS may elect to activate and monitor brown tree snake traps surrounding the immediate vicinity of tent cities. WS Detector dog teams will periodically walk through the area while troops are being staged prior to departure from Guam. Particular attention to BTS control measures is needed while breaking camp and re-packing tents and equipment susceptible to BTS infestation during bivouac and field training.

C. Cleaning Procedures

Responsibility. Prior to staging in a WACSA and embarkation aboard an aircraft or ship, each training unit will be responsible for cleaning its vehicles and equipment. For vehicles and equipment considered to be high-risk, additional procedures may be required such as high-pressure washing, steam-cleaning, fumigation, or other methods suggested by WS. These additional efforts will supplement any inspection conducted by cargo handlers, unit personnel and WS.

Cleaning Facilities and Equipment. AAFB and COMNAVMARIANAS will provide cleaning areas. If cleaning equipment is unavailable or if the exercise scenario would increase the risk of snake infestation of vehicles, the training units may be tasked with augmenting or providing all necessary cleaning equipment and supplies. To request installation support, training units may contact the following units:

For Andersen Air Force Base: Call Vehicle Operations at 366-2239, 24 hours, 7 days per week.

For COMNAVMARIANAS: Call the COMNAVMARIANAS Area Training Officer (Code N3) 339-6141.

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D. Inspection Procedures on Guam

General. The inspection procedure is a joint military/WS effort. It includes individual user and cargo handler attention when packing materials for air and sea embarkation, and a subsequent thorough, systematic inspection of cargo, equipment, and vehicles by WS. To maintain open lines of communication among all involved, DOD will provide WS the names of military contacts at the shipping or air terminals, and WS will keep the military points-of-contact informed of their BTS inspection activities.

WS inspections are required for all outbound cargo. This includes inspections of equipment belonging to units stationed on Guam, and equipment that is transported to Guam by transient units from CONUS, Hawaii, or Japan for subsequent exercise support. Upon completion of the exercise, another inspection is required for equipment that will be cleaned, packed, and embarked for movement to home installations off-island.

Inspecting Personal Equipment. Military commanders are responsible for ensuring that all personal gear, hand-carried equipment and supplies, and tent canvas are visually inspected by military personnel as it is repacked when breaking camp. To facilitate the inspection, personal equipment and tent canvas will be laid out for WS detector dog inspection prior to palletizing or loading into shipping containers.

Inspecting Outbound Cargo. The decisions are based on the nature of the training exercise and volume of cargo to be transported from Guam to an off-island location. The objectives are to minimize the timeline necessary between cleaning and embarking equipment, and to minimize the use of a WACSA without degrading BTS control and interdiction protocols. The military commander and WS cooperate in making these decisions.

Inspecting Transports. The WS Detector Dog Teams may be tasked to inspect accessible transport craft (ship, barge, and/or airplane) prior to departure from Guam.

Inspecting Heavy Equipment and Vehicles. This equipment is often used to support field maneuvers prior to movement to the port of embarkation. WS Detector Dog Teams will inspect all heavy equipment and vehicles after they have been thoroughly cleaned.

Snake Detected or Suspected. If the detector dogs alert to a possible BTS on a vehicle, pallet, or at the threshold of a locked container, the suspected equipment will not be moved. A second detector dog team may be brought on-scene to confirm the first dog alerting to BTS presence. If the BTS is not discovered, the affected military unit will break out the cargo to allow BTS detection and elimination. If the BTS is not immediately found, WS will intensify its search and may activate additional traps in the vicinity of the affected shipment.

All outbound cargo is to be cleaned, inspected and immediately loaded onto a vessel or aircraft. If there is a delay between inspection and loading, cargo may be subject to WS reinspection or be placed in an approved WS cargo staging area. WS will decide on the proper course of action. WS may determine that any ship, barge, boat or aircraft that was inspected and then unattended may require another inspection prior to departure. Cargo, vehicles, and equipment held within a WACSA for an extended period (such as during the night when snakes are active) may be subject to additional inspection prior to loading for departure.

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Schedule and Plan Modifications. WS plans its personnel and detector dog team assignments based on published exercise plans, arrival and departure schedules. Sites to be used as WACSA at ports of embarkation and debarkation are selected in advance and activated prior to the exercise commencing. Relocating established WACSA might not be feasible. However, given reasonable time to react, WS may alter its personnel and detector dog team schedules and assigned cargo and vehicle inspection sites. Since the BTS protocols take precedence when executing tactical troop and cargo movements from Guam, the arrival and departure schedules and points-of-contact will be verified by the military so that WS support will be on-hand when expected.

Inspection Verification Process for Tinian Shipments. WS personnel will identify inspected items within Guam containment areas by affixing a stamp and/or tag to cargo or cargo manifest denoting the words "Snake-Inspected" together with date and time the inspection occurred.

WS will be especially watchful to ensure that airdrop cargo for Tinian has been thoroughly inspected and is tagged for identification by CNMI Customs Inspectors.

E. Inspection Procedures on Tinian

Military exercises may involve personnel, cargo, and equipment movement between Guam and Tinian, CNMI. Similar staging and inspection processes for Tinian may be established at other island training sites.

1. Prior to a training exercise commencing on Tinian, WS personnel will identify, purchase, and make arrangements with DOD to transport BTS control and interdiction tools and equipment such as temporary snake barrier components, snake capturing equipment, and lighting. WS personnel will train volunteering wildlife and/or customs officials to assist with BTS interdiction measures
2. Supporting cargo that is shipped to Tinian from Guam in advance of the training exercise is subject to the routine cargo inspection process conducted daily by WS. A WACSA-type barrier may be used at the Tinian harbor, and the cargo will be checked by CNMI Quarantine Inspectors to ensure that BTS inspection was conducted on Guam and the stickers/tags then removed.
3. Prior to arrival of the first military cargo from Guam to Tinian, WS will review the BTS protocol and necessary actions with the on-scene federal and CNMI wildlife and/or quarantine officials. Exercise planning will include designating the following: responsible logistics personnel, cargo offloading and staging areas, and cargo drop zones to be used that will require BTS control measures. WS will conduct BTS surveillance during nighttime cargo offloading, staging, and release of inbound traffic from Guam. WS will coordinate spotlight searches of staging areas, fence lines, and any tree lines/forest areas in proximity to runways/taxiways that are designated as drop zones. These areas will be targeted during inbound and exiting traffic times.

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4. The majority of personnel, cargo, and equipment that deploy from Guam to Tinian are air-transported to North Field (preferred) or the West Tinian Airport as part of the military exercise. Prior to arrival, sections of angled weather shading will be used to establish a containment area for offloaded personnel and cargo. The portable barrier will be erected and maintained about five days prior to the first shipment. Prior to the arrival of exercise personnel and cargo, snake traps with a mouse attractant, food and moisture source will be installed in the forest adjacent to the barrier. Snake traps inside the barrier will be a passive design.
5. WS will maintain the BTS traps at the containment area throughout the duration of the training exercise. Some traps will be installed near parachute drop zones and near take-off zones. Additional BTS traps shall be made available for contingency plans and in case BTS sightings occur in the exercise area.
6. An anti-coagulant toxicant (contained within a tamper proof bait box) will be used in and around brown tree snake trapping areas and near cargo containment/temporary snake barriers to reduce local rat populations. Removal of rats reduces the potential damage they inflict to traps and barrier material.
7. CNMI DLNR may provide Snake Detector Dog Teams from Saipan on short notice if BTS presence is suspected.
8. When shipments reach Tinian, CNMI Quarantine Inspectors may check for the BTS inspection stamp/tag that verifies that the inspection process was conducted on Guam. If there is no tag on cargo that originated in Guam, the cargo may be reloaded aboard the aircraft/ship and returned to Guam. The inspection stamp/tags will be removed prior to the cargo being moved out of the containment area or drop zone. It is important that the tags be removed to avoid any confusion when the equipment and vehicles are returned to Guam at the end of the exercise, and subsequently re-inspected prior to transient unit departures to home installations.
9. WS will maintain a log of all cargo, vehicle, equipment, and craft that are inspected and will monitor the time between inspection and movement. CNMI-DLNR staff may request copies of inspection logs and cargo manifests. WS and CNMI DLNR will continue to support inspection and surveillance at Tinian's air and sea ports of entry and exit until military forces have departed and the exercise is formally terminated.

VI. GUIDELINES FOR BTS SIGHTINGS

Emergency Response Procedures are published for COMNAVMARIANAS and Andersen Air Force Base to contact Guam WS immediately (see Table 1). Similar procedures have also been identified for publication at military bases in Hawaii, in case BTS are sighted or suspected in returning shipments. These procedures to obtain immediate support from Hawaii Department of Agriculture and WS are found in Enclosure (2).

A. Immediate Action

1. **Make every attempt to kill or to capture the snake.** Do not delay. The cost and difficulty of trying to locate an escaped BTS coupled with the potentially significant ecological impacts of

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each snake justifies the killing or capturing of the snake immediately. If it is not possible to kill or capture the snake, maintain visual contact.

- A BTS can be captured by pinning it down with one's boot heel, a stick or rifle butt, or anything heavy. A sharp blow to the snake's head with the butt of a (unloaded) rifle or boot heel should be fatal.
- A bucket or heavy box can be used to capture a snake on a flat surface. Place the container over the head of the snake leaving enough space for the snake to crawl completely underneath the container. Then weight it down to confine the BTS. If bagging a stunned or pinned-down snake, grab it directly behind its head.
- Keep any dead or captured snake available for positive identification by WS or an Environmental Monitor.

2. **Exercise caution.** When threatened, a BTS will coil back into a strike position, flatten its head, and lunge to bite. Small grooved fangs located in the rear of the mouth enable the mild venom to trickle into the bite while the snake constricts. A normal defensive strike from a BTS will not allow the rear fangs to penetrate the skin and will usually result in minor punctures similar to pinpricks. When wearing battle dress uniforms (BDU) and field boots, a bite from a BTS will not penetrate clothing or footwear. Use caution with all snakes. There is the chance, although unlikely, that other, more dangerous, snakes could be encountered.

B. BTS Sighting on Tinian or Other CNMI Sites

Tinian is a BTS-free island, therefore, killing or capturing a sighted BTS is critical. Reaction to a BTS sighting on Tinian and subsequent incident reporting procedures are the same as described above for sightings on Guam. Staff response during major military training exercises on Tinian may include representatives of CNMI Division of Fish and Wildlife, WS, and/or Navy environmental monitor staffs. All are equipped with cellular phones. The latter will have radio/telephone communication with the CESG.

Exercise caution, safety and discretion. The priority action becomes killing, capturing, or containing the BTS. Report the incident, including the same information as needed for Guam BTS sightings.

The telephone numbers to call are:

CNMI Fish and Wildlife Saipan office:	(670) 664-6011/6000
CNMI Emergency Management Office:	(670) 322-9528/9
CNMI Fish and Wildlife Tinian office:	(670) 433-9298
USGS-RRT:	(671) 777-4477

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USDA APHIS WS Guam District Office:	(671) 635-4400
USDA APHIS WS AAFB:	(671) 366-3822
USDA APHIS WS COMNAVMARIANAS	(671) 472-7101

CNMI will dispatch investigating personnel and detector dog team assistance. The WS and Navy Environmental Monitors/CESG will also be notified (via cellular phone numbers provided prior to the exercise).

C. Notifications for BTS Sightings on Guam

When a BTS is sighted, the immediate action is to kill or immobilize the snake so that it cannot escape. The person involved will then collect information of the incident that will describe the circumstances of the sighting, and remain on scene to act as primary POC to other responders. WS may call upon the person who discovered the snake to collect additional information.

1. When a BTS is sighted, killed and/or captured on Guam, or a BTS is suspected to be in a specific area, immediately contact the local area WS office, COMNAVMARIANAS and/or Commander. 36th ABW. The caller will provide the following information regarding BTS presence and will be given instructions regarding follow-on action:

- Caller:
- Military Organization:
- Sighting Location:
- Status: (Snake Killed/Captured/Contained/Loose)
- Date and Time of Sighting:
- Initial Response Action Underway at the Scene:

2. The telephone numbers to call during business hours are:

USDA APHIS WS Guam District Office:	(671) 635-4400
USDA APHIS WS AAFB:	(671) 366-3822
USDA APHIS WS COMNAVMARIANAS	(671) 472-7101

(WS is on call 24 hours per day, and WS field personnel are equipped with cellular telephones. The telephone numbers will be published prior to military exercises).

3. During major exercises, the unit and/or COMNAVMARIANAS will contact the CESG, who will alert exercise personnel needed to respond and the COMNAVMARIANAS Quarterdeck at (671) 339-7133. Cellular telephone numbers will be published prior to major exercises for contact with command Environmental Monitors in the field.

Once notified of a sighting and circumstances, WS will dispatch personnel and/or BTS Detector Dog Teams to the scene. Military personnel will cooperate fully with WS and their inspection of the area, and may provide any assistance needed to locate and capture a BTS.

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D. Post-Training Exercise Snake Sighted in Hawaii

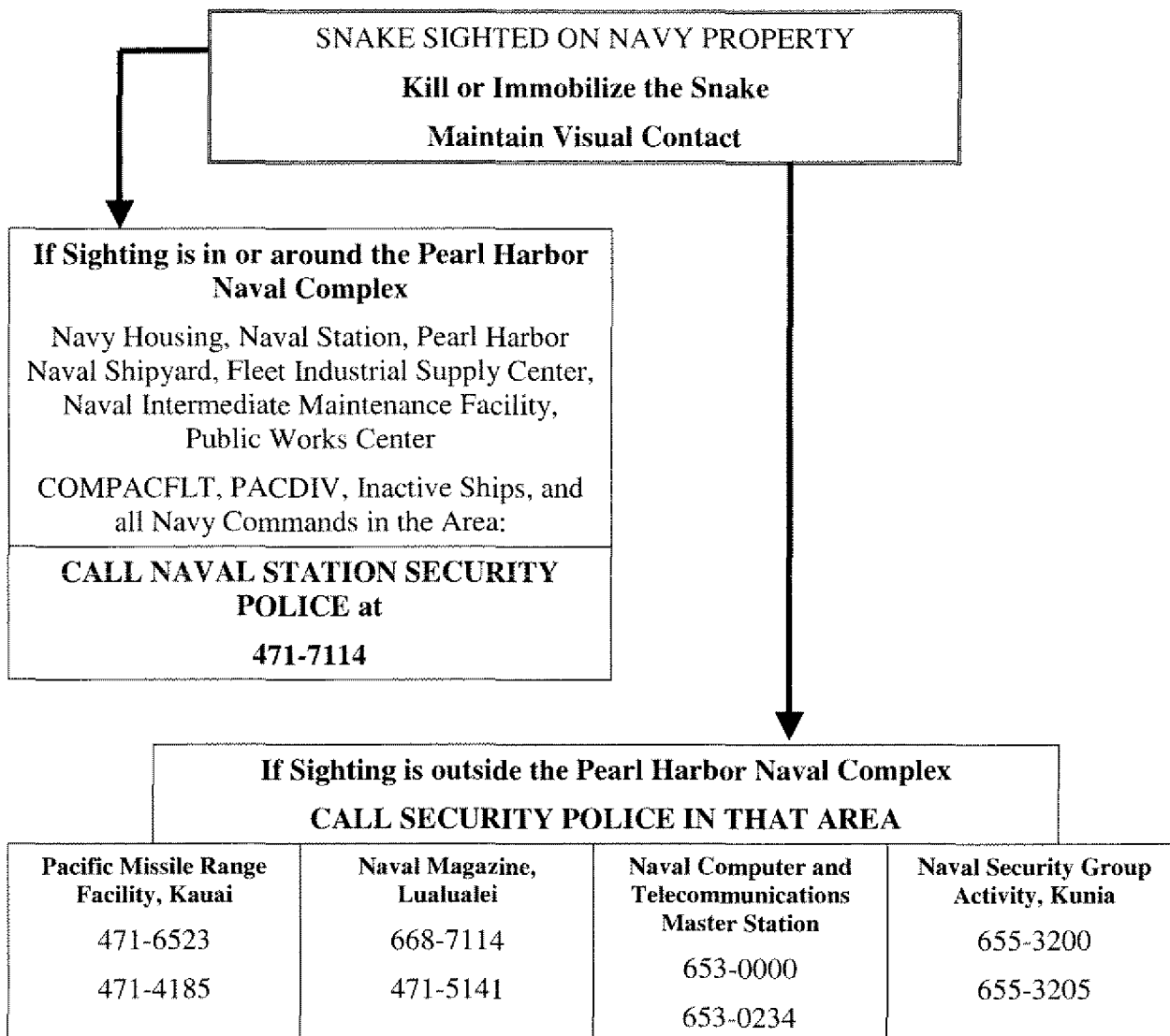
The Emergency Response Protocols established for snake sightings at Navy and Marine, Air Force, and Army installations on Oahu are attached as Enclosure (2). The principal state agency that must be informed is the Hawaii Department of Agriculture (HDOA), Plant Quarantine Branch at (808) 586-7378 or 586-PEST.

VII. REFERENCES

- Brown Tree Snake Control Committee, Aquatic Nuisance Species Task Force. June 1996. *Brown Tree Snake Control Plan*.
- Commander, Amphibious Group One Naval Message 040925Z December 1999, "USS Ogden and USS Rushmore Guam Equipment Washdown 7-13 Nov 99, Consolidated After Action Report of Lessons Learned."
- Commander, U.S. Navy Marianas. October 1996. "Brown Tree Snake (BTS) Control/Interdiction Plan for Military Training Exercises."
- United States Department of Agriculture – Animal and Plant Health Inspection Services – Wildlife Services, Program Aid No. 1636, October 1998. "No Escape from Guam: Stopping the Spread of the Brown Tree Snake."
- United States Department of Agriculture – Animal and Plant Health Inspection Services – Wildlife Services – National Wildlife Research Center, et al. July 1998. "1998 Brown Tree Snake Research Symposium."
- United States Department of Agriculture. June 1996. *Environmental Assessment for Brown Tree Snake Control Activities on Guam*.
- United States Department of Interior, Office of Insular Affairs. September 1999. *Integrated Pest Management Approaches to Preventing the Dispersal of the Brown Tree Snake and Controlling Snakes in Other Situations*.
- United States Pacific Command. June 1999. Final Environmental Impact Statement, Military Training in the Mariana Islands.

HAWAII EMERGENCY RESPONSE PROTOCOLS

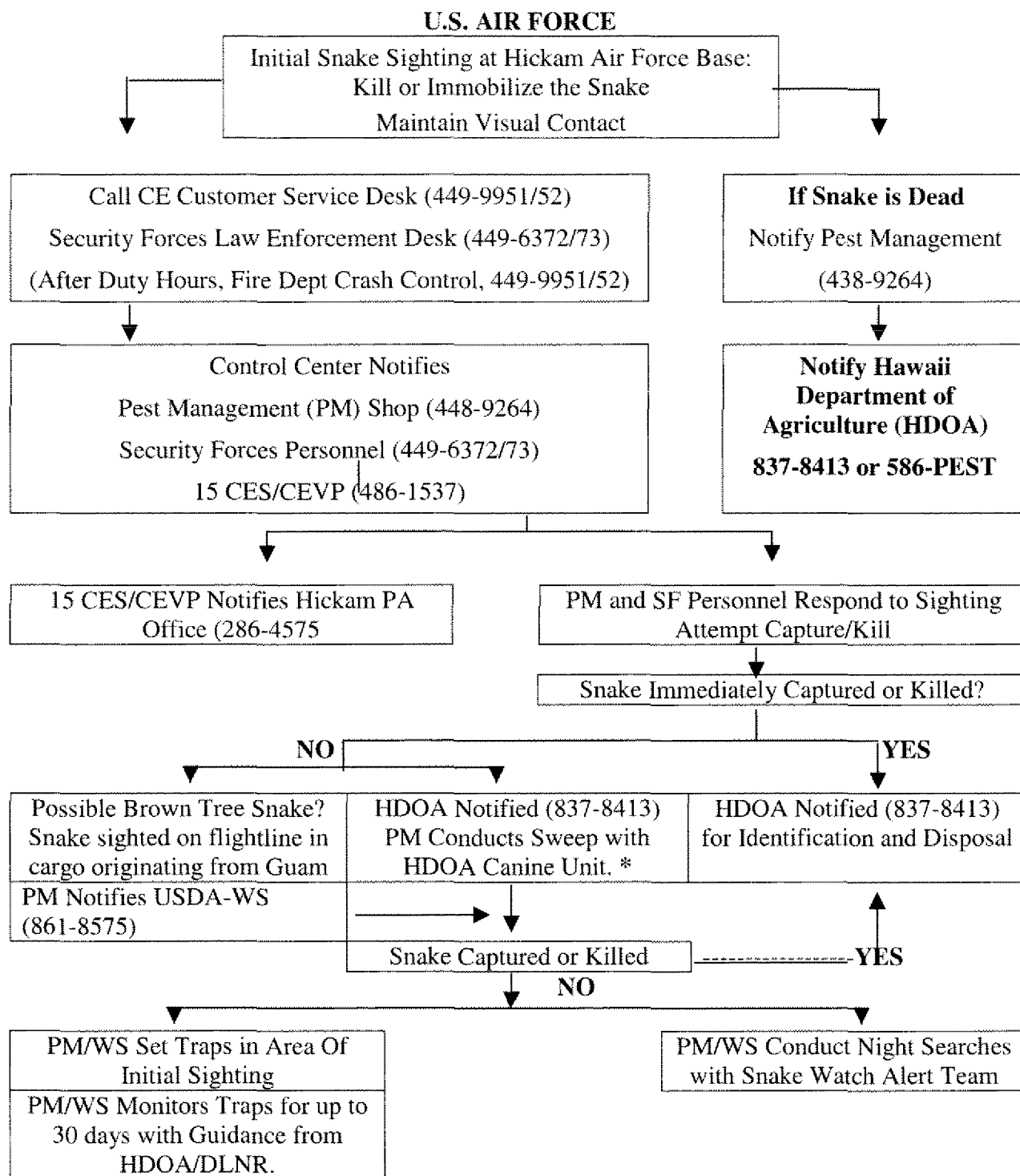
U.S. NAVY



Area Security Police will provide first response to sighting and inform NAVSTA dispatch at 71-7114 and the Department of Agriculture at 586-7378. First responders will collect information on the snake sighting, if it was killed or captured, and act as the primary POC to others responding to the scene. Security Police are trained in snake response equipment and techniques.

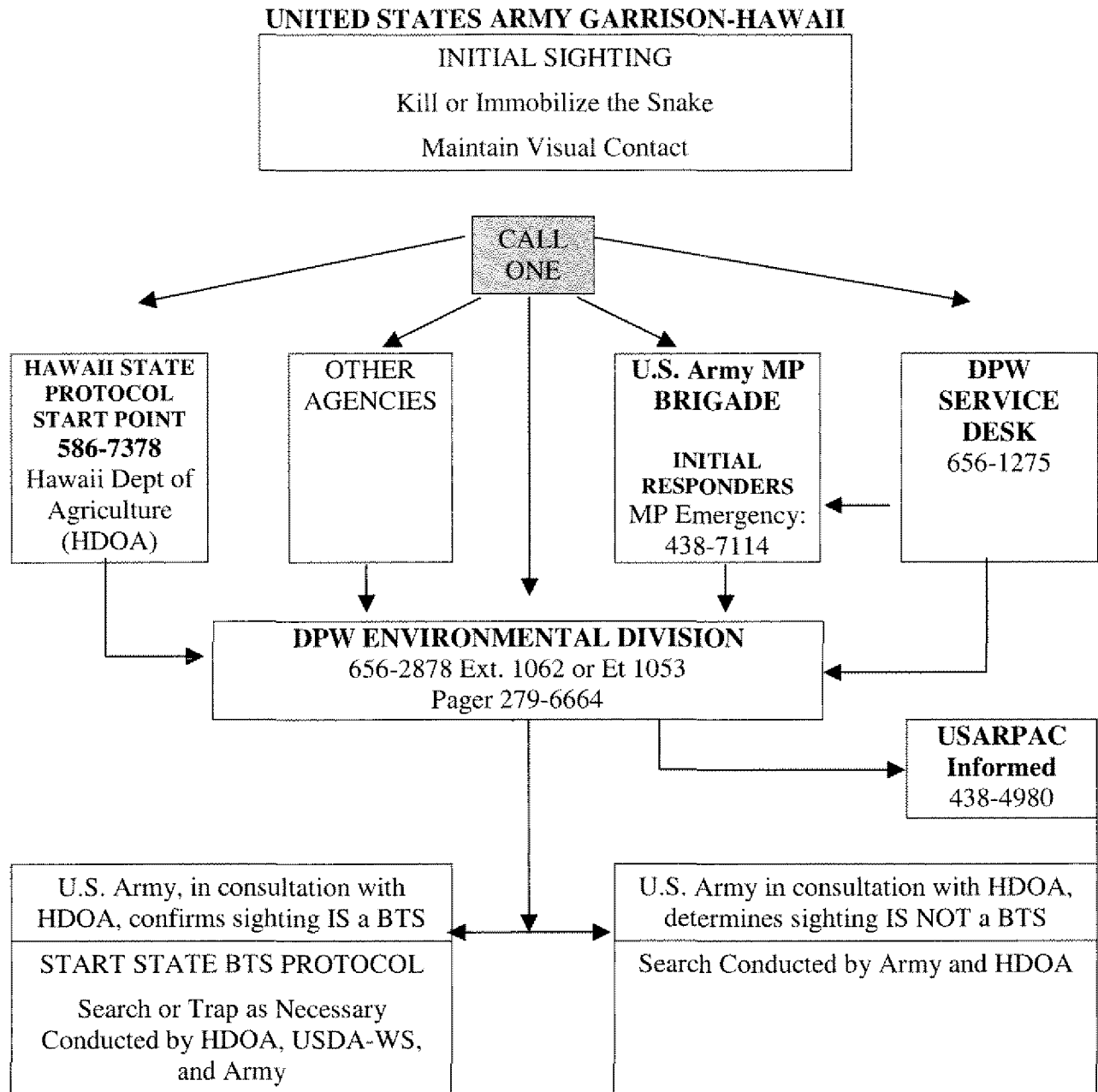
All civilian and military personnel will be briefed on BTS and trained to respond and comply with reporting procedures. The videotape "The Silent Invader" will be shown as part of this training. Training should be recurring. BTS posters will be displayed in buildings to remind personnel of the danger. The reporting number should be changed to the number for that area. For more information, contact the COMNAVBASE Pearl Harbor Regional Conservation Coordinator, at 471-0326, or Environmental Protection Specialist at 471-1171, extension 233. Alternate number is 471-1171, extension 225 (pager number 361-4864).

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Notify J431, USCOMPAC at 477-0850 if State and WS activate Emergency Response Team.

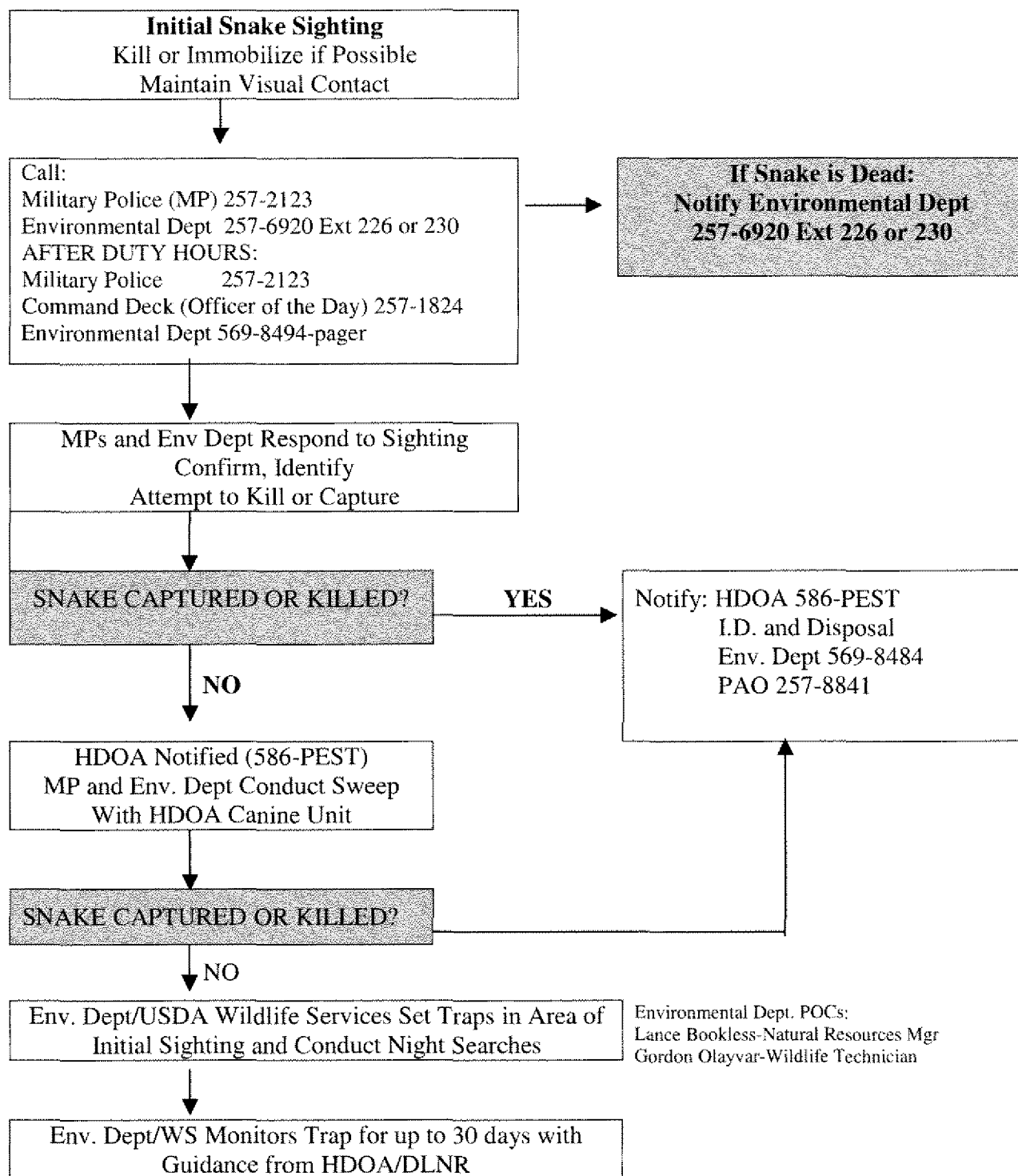
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If State and WS Emergency Response Team are dispatched to military installations, notify J421, USCOMPAC at 477-0850.

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MARINE CORPS BASE HAWAII, KANEOHE BAY



establishes the cooperative relationship between all signatories in administering BTS control and research activities.

1.2.1. Interdiction Program Requirements. All shipments by air or sea of material originating from Andersen AFB facilities for military exercise support, day-to-day military cargo and equipment and private contractors will be inspected by USDA WS personnel and/or their trained snake detection canines and properly document the inspection before transport off-island. All aircraft, military or civilian, taking off from Andersen AFB will be inspected by USDA WS to the maximum extent possible.

1.2.2. Oversight. 36 CES/CEV will designate a BTS Management Liaison responsible for administering the program outlined in this instruction and resolving any issues dealing with BTS management on Andersen AFB.

1.2.3. Role of U.S. Department of Agriculture Wildlife Service. Control and interdiction protocols will be practiced on a daily basis by private sector contractors and military organizations and/or personnel from Guam's USDA WS, which is the primary federal agency responsible for ensuring the BTS does not leave the island of Guam. USDA WS works cooperatively with the Department of Defense to implement proactive control measures aimed at preventing BTS dispersal.

1.2.3.1. All aircraft and cargo destined for off-island locations have a 100% requirement for BTS inspection. USDA WS personnel require a minimum of 2 hours' notice for inspections and will have detector canine teams available 24/7.

1.2.4. Role of Department of Defense. Andersen personnel involved with military training exercises, operational requirements, private contractors and BTS control/interdiction programs will:

1.2.4.1. Plan, direct, and coordinate all cargo handling procedures for cargo departing Guam with consideration for the on-going threat to the Pacific spread of BTS. Cargo handlers and/or managers will work closely with USDA WS personnel to establish and maintain effective cargo and equipment BTS inspection processes. The agency responsible for the BTS inspection or staging area will coordinate for and provide area lighting when needed.

1.2.4.2. Fully cooperate with USDA WS to conduct measures necessary to reduce the BTS snake population at port and cargo facilities through an integrated approach consisting of technical assistance and lethal and non-lethal control methods such as prey base reduction, exclusion, habitat modification, and capture.

1.2.4.3. Provide USDA WS with adequate forward notification of cargo movements that are not part of typical daily operations, as outlined in the corresponding chapters of this instruction, and assist them as necessary to facilitate the timely completion of the mandatory inspection process.

1.2.4.4. As part of major exercise planning, address BTS control and interdiction procedures in the exercise plan's AF Form 813, Request for Environmental Impact Analysis, in consultation with USDA WS.

1.2.5. Education and Awareness Requirements. The 36 CES/CEV BTS Management Liaison will coordinate closely with USDA WS to obtain and disseminate materials related to BTS education and awareness. Units involved with military training exercises, operational requirements, private contractors and BTS control/interdiction programs at Andersen will:

1.2.5.1. Publish and distribute the BTS Emergency Response Protocol. Prominently display contact information and telephone numbers to report BTS sightings (Attachment 1).

1.2.5.2. Conduct information briefings for both permanently assigned and transient personnel based on materials provided by 36 CES/CEV and USDA WS. Explain the potential for impacts if BTS were transported from Guam in military vehicles, cargo and equipment. Explain individual responsibilities if and when a BTS is sighted (kill/capture/immediately report to USDA WS). Use the BTS Awareness instructional videotapes and printed materials, requesting USDA WS participation and/or demonstrations at the briefings when their workloads permit.

1.2.5.3. Provide information cards to personnel as a reminder of the threat and responsibilities for immediate action.

1.2.5.4. Clearly display BTS identification and information posters in tent cities, dormitories, and work sites.

Chapter 2

OUTBOUND AIRCRAFT INSPECTION PROCEDURES

2.1. Requirements. Aircraft departing for off-island destinations are required to undergo 100% BTS inspections by USDA WS personnel with detector canines. USDA WS requires a minimum of 2 hours' notice in order to conduct an aircraft inspection.

2.2. Exemptions. Aircraft flying local missions that are not scheduled to land off-island are exempt from USDA WS inspection.

2.2.1. Since the BTS is nocturnal, quick-turn aircraft that remain on the ground less than 3 hours during daylight do not require BTS inspection.

2.2.2. Commercial aircraft that remain on the ground less than 3 hours during night time (any time on the ground between official sunset and sunrise) will undergo a visual BTS inspection. Commercial aircraft remaining longer than 3 hours will be prepared for a canine inspection. If a canine inspection occurs, the APU's on commercial aircraft will be off.

2.2.3. Urgent missions, such as MEDEVAC, will not be delayed in order to accomplish a BTS inspection. However, every effort will be made to conduct inspections on these aircraft prior to their scheduled departures.

2.3. Incoming Aircrew Notifications. 36 OSS will publish the following notification of BTS inspection requirements in the appropriate Flight Information Publications: "All aircraft departing Andersen AFB are required to have a brown tree snake inspection conducted by USDA WS. Changes in scheduled departure times require three hours' prior notice to ensure timely accomplishment of this inspection."

2.3.1. 36 OSS will require military aircrews with off-island destinations to file their flight plans no later than 3 hours prior to the desired departure time in order to provide enough response time to the USDA WS.

2.3.2. 36 OSS will relay BTS inspection requirements to deployed units during the "Local Area Knowledge" briefing.

2.4. USDA Notifications. Airfield Management (36 OSS/OSAM) will make a printed copy of the consolidated daily flying schedule available to USDA WS no later than 0600 each day. Failure to provide more than 2 hours' notification may result in a stop movement until an inspection can be conducted.

2.4.1. The 734th AMS is responsible for notifying USDA WS of changes to the daily flying schedule for any of the AMC controlled assets. This notification will be made as soon as possible after learning of the proposed change.

2.4.2. The 36 WG Command Post is responsible for notifying USDA WS of changes to the daily flying schedule for any non-AMC controlled assets. This notification will be made as soon as possible after learning of the proposed change.

2.4.3. HSC-25 will coordinate directly with USDA WS to ensure their aircraft with off-island destinations inspected prior to departure.

2.4.4. The 36 OSS will ensure that aircraft inspections are documented in the Access Database upon receipt of an outbound flight-plan. If no inspection is indicated, 36 OSS will coordinate with USDA WS to get the inspection completed. Every effort will be made to avoid departure delays.

2.5. Documentation Requirements. USDA WS will notify 36 WG Command Post upon completion of each aircraft inspection. 36 WG Command Post will annotate completed inspections in the Access database, annotating the entry with the initials or name of the USDA WS personnel making the notification.

2.5.1. Database Access. The Access database will be visible to authorized users within the 36 WG Command Post, 36 OSS, Expeditionary Bomb Squadron, Tanker Task Force, and 734th AMS. USDA WS will be provided information from the database upon request to any authorized user.

2.6. Authority to Stop Movement. The installation Commander has delegated authority to 36 OSS, upon a request by USDA WS made either directly or via the 36 WG Command Post, to stop any aircraft from departing Guam that has not been inspected and/or is suspected to harbor BTS.

2.6.1. The 36 OSS personnel who direct the stop movement will inform the 36 OSS/CC or his designated representative. The 36 OSS/CC or his designated representative will ensure 36 EOG/CC is briefed on the incident.

2.7. Aircraft departing without inspection. If an aircraft departs without having a BTS inspection accomplished, USDA WS will contact the appropriate agencies at its destination and inform them.

2.7.1. The 36 WG Command Post will inform the 36 OSS/CC or his designated representative if any aircraft has departed without the appropriate BTS inspection. The 36 OSS/CC or his designated representative will ensure wing leadership is briefed on the incident.

Chapter 3

AERIAL PORT CARGO INSPECTION PROCEDURES

3.1. General Responsibilities and Requirements. Outbound aerial shipments from Andersen include general freight, household goods, and unaccompanied baggage.

3.1.1. The 734th Air Mobility Squadron (AMS) on AAFB handles all outgoing air freight. Containers are delivered to the 734 AMS warehouse area, where they are then palletized, processed, and eventually loaded onto aircraft.

3.2. Routine cargo inspections. Inspections of outgoing air cargo are conducted at the 734 AMS warehouse area.

3.2.1. 734 AMS personnel will inspect all originating boxes for holes, punctures, damage and/or cracks that may permit BTS access and inspect all shipments throughout the selection, palletizing, building and loading process. 734 AMS personnel will handle and stack each sealed box individually while building up pallets.

3.2.1.1. 734 AMS will ensure all personnel receive initial in-depth training on procedures to follow upon spotting a BTS and coordinate with WS for periodic follow-up BTS awareness training sessions. Personnel will remain alert for BTS signs or opportunities at all times.

3.2.2. USDA WS will perform routine sweeps of the 734 AMS warehouse and cargo yard grid three times daily, M-F, and twice daily, Sat-Sun, and maintain a log book in the dispatch area that details their inspection dates and times.

3.3 USDA Notifications. 734 AMS load planners will notify USDA WS when load plans are complete, approximately 4-6 hours before departure. Notification will be either in person if USDA WS personnel are present or by phone when necessary.

3.4. Documentation Requirements. The 734 load planner will annotate the load plan with the time and name of the person notified. Upon completion of the inspection, USDA WS will notify 36 WG Command Post. 36 WG Command Post will update the central inspection database accordingly.

3.5 Authority to Stop Movement. The installation Commander has delegated authority to 36 OSS Commander or his designated representative, upon a request by USDA WS made either directly or via the ATOC, to stop any aircraft from departing Guam with any cargo or equipment that has not been inspected and/or is suspected to harbor BTS. 734 AMS ATOC personnel should notify USDA WS and 36 OSS Airfield Management if cargo about to be loaded onto an aircraft or vehicle has not undergone the appropriate BTS inspection.

Chapter 4

MUNITIONS SHIPMENT INSPECTIONS

4.1. Requirements. Munitions movements typically consist of either break-bulk/uncontainerized or International Organization for Standardization (ISO) container movements that are transported to Kilo Wharf on COMNAVMARIANAS, or those which are loaded directly onto aircraft at Andersen AFB. MUNS will schedule BTS inspections through USDA WS in order to better coordinate any munitions activities going on the same day.

4.2. Break-bulk/uncontainerized munitions:

4.2.1. Munitions pallets will be staged in an area conducive to USDA WS BTS inspections prior to on loading onto trailers for transport to Kilo Wharf.

4.2.2. USDA WS canine inspections will be conducted on the munitions while at the staging area before they are loaded.

4.2.3. Munitions will not be loaded on trailers which are not ready for immediate transport (within the same day). Munitions that have been exposed to the environment (not sealed in containers) overnight must be re-inspected by USDA WS prior to transport.

4.3. ISO containers:

4.3.1. Munitions will be staged in an area conducive to USDA WS BTS inspections prior to loading into the containers.

4.3.2. USDA WS canine inspections will be conducted on the munitions while at the staging area before they are loaded into the containers.

4.3.3. Containers not fully loaded, which are to be left unattended overnight, will be sealed after the last USDA WS BTS inspected munitions are loaded into the ISO container. All munitions that were not sealed in containers overnight must be inspected before loading continues on the following day.

4.3.4. Munitions destined for movement via aircraft will be coordinated through the 734 AMS and USDA WS for the BTS inspection prior to loading.

4.4. USDA Notifications. 36 MUNS will attempt to provide an estimated shipping date to USDA a minimum of 30 days out, for most large munitions shipments (i.e. Turbo CADS). Given that this projected date will be tentative, USDA WS will request further updates from MUNS, who will provide a firm target date for all munitions shipments at least 7 days in advance (unless MUNS receives less notice, in which case they will notify USDA WS immediately after learning of the short-notice shipment) and a minimum of 3 hours' notice for any inspections desired on that date.

4.5. Documentation Requirements. 36 MUNS personnel will make an entry in the BTS log located in the crew chief book that identifies the USDA WS inspector for that day's shipment and the approximate time the inspection was conducted, which will then be initialed by the handler conducting the inspection. Before the close of each day in which USDA WS has inspected munitions, USDA WS will coordinate with 36 MUNS to schedule an end-of-day verification of loaded munitions status. At the end of each day, 36 MUNS will make an entry in the BTS log located in the crew chief book verifying that all containers containing munitions packed for shipment have been closed prior to darkness, and the approximate time those containers were closed; USDA WS will authenticate this entry by initialing it.

Chapter 5

TMO SHIPMENTS

5.1. Requirements. Containerized household goods and unaccompanied baggage shipments for Air Force personnel and DOD civilians departing from Andersen AFB, as well as other items scheduled to leave Guam via surface vessel, are managed by Andersen's Transportation Management Office (TMO). When items are shipped by surface vessel, only those containerized prior to transportation to the waterport are addressed by this instruction.

5.1.2. The packing and loading of all household goods at Andersen, including unaccompanied baggage, is accomplished by carriers/local agents before the goods are surface-transported to the port for shipping. USDA WS will promote BTS education and training to local agent/carrier employees.

5.1.3. Items that are of greatest concern are those that have been stored outdoors or in carports and sheds, such as washers, dryers, swing set tubing, lawnmowers, barbeque grills, lumber, pipes, garden hoses, and vehicles. Personnel will be briefed by the TMO that USDA WS will be at the residence to inspect for the presence of BTS.

5.2. Prioritization. Although USDA WS will make every reasonable effort to perform HHG inspections, since HHG are packed at several geographically separated locations simultaneously, USDA WS will prioritize inspections based upon a risk analysis, conducting daily inspections on shipments deemed to pose the largest risk first. Risk factors they consider include packout location, shipment size (shipments of less than 4,000 pounds present a negligible risk), destination (Hawaii and Diego Garcia have the highest priority), and contents (large quantities of goods and equipment stored outdoors carries a higher risk).

5.3. USDA Notifications. TMO will provide USDA WS with a schedule of the upcoming week's HHG packouts and any other container movements every Friday; in addition, they will provide a detailed schedule every day by COB that identifies the type of shipment, carrier, and estimated weight for each of the next day's packouts and container movements.

5.4. Documentation Requirements. USDA WS will make a copy of the weekly schedule and annotate each shipment that was inspected with the inspector's name or initials. USD WS will provide this documentation to TMO ten (10) days later (the following Monday). TMO will maintain these documents on file for at least one year after completion.

5.5. Outbound Privately Owned Vehicles. A significant component of the PCS movement process, personally-owned vehicles (POVs) are handled through a single facility at COMNAVMARIANAS. Vehicles departing Guam are not inspected at Andersen.

5.5.1. USDA WS will conduct canine inspections daily (Monday-Friday) on outbound vehicles at the COMNAVMARIANAS POV lot before being packed directly into 20' or 40' containers and trucked to the Commercial Port for loading onboard a civilian cargo ship. If a vehicle is

inspected but not loaded prior to the close of business on a given day, USDA WS will conduct a follow-up inspection the next business day.

Chapter 6

HSC-25 AIRCRAFT INSPECTION PROCEDURES

6.1. Requirements. Since the BTS is nocturnal; maintenance personnel are present on the flight line in large numbers during the daytime; and pre-flight visual inspections are conducted; a morning inspection of HSC-25 aircraft by USDA WS is considered valid for all flights that take off during daylight hours that same day.

6.1.1. USDA WS inspections of HSC-25 aircraft will be conducted daily prior to the beginning of each day's scheduled flights. To the maximum extent possible, inspections will be conducted at a regular, recurring time as agreed upon by HSC-25 and USDA WS. To ensure timeliness and efficiency, only those aircraft identified by HSC-25 Maintenance Control as viable for flight operations will be inspected. The inspection time will be pre-coordinated between HSC-25 and USDA WS personnel and an HSC-25 Plane Captain will accompany the USDA WS inspector during the inspection to ensure the safety of all personnel and aircraft inspection integrity.

6.1.2. During pre- and post-flight inspections, the inspection of all bays and access panels will include a visual check for potential BTS. In addition, maintenance personnel who are servicing aircraft, conducting daily inspections, and troubleshooting maintenance discrepancies will remain vigilant for BTS incursion. At the completion of daily maintenance, maintenance personnel will ensure all intakes are plugged and all door/panels are secured, which should greatly reduce the possibility of nighttime BTS entry.

6.2. Exemptions. Any aircraft flying missions that are not scheduled to touch down off-island are exempt from USDA WS inspection.

6.2.1. Emergency response exemption. Since delaying an immediate launch for SAR or MEDEVAC is potentially life-threatening to the victim(s), HSC-25 will not delay such missions in order to be inspected. HSC-25 is responsible for informing USDA WS of the short-notice mission upon receipt; if the inspection is not conducted, USDA WS is responsible for making any notification to agencies they deem applicable at the intended destination.

6.3. USDA Notifications. HSC-25 will provide USDA WS a Flight Schedule the evening prior to each Fly Day. The Flight Schedule will annotate the BTS Inspection Time as coordinated between HSC-25 and USDA WS, as well as any known missions that will require HSC-25 to put wheels down anywhere other than Guam soil.

6.3.1. HSC-25 will notify USDA WS of any changes to this schedule when they involve an aircraft taking off during the hours of darkness, at the earliest opportunity once HSC-25 is aware of the change. HSC-25 will also notify USDA WS of any short-notice/emergency flights that would normally require inspection as soon as feasible, but will not delay an emergency response in order to receive an inspection.

6.3.1. Cargo Inspection Notifications. HSC-25 routinely moves cargo for NSWU-1, EODMU-5 and MSS-7, as well as MSC and AF SFS. Any unit transporting cargo via HSC-25 is responsible for clearing their own cargo through USDA WS prior to it being transported to or by HSC-25.

6.3.2. HSC-25 will inform units making requests for cargo transportation of the USDA WS inspection requirement. Units are responsible for notifying USDA WS of the cargo location and estimated pickup time NLT 3 hours prior to the intended pickup time.

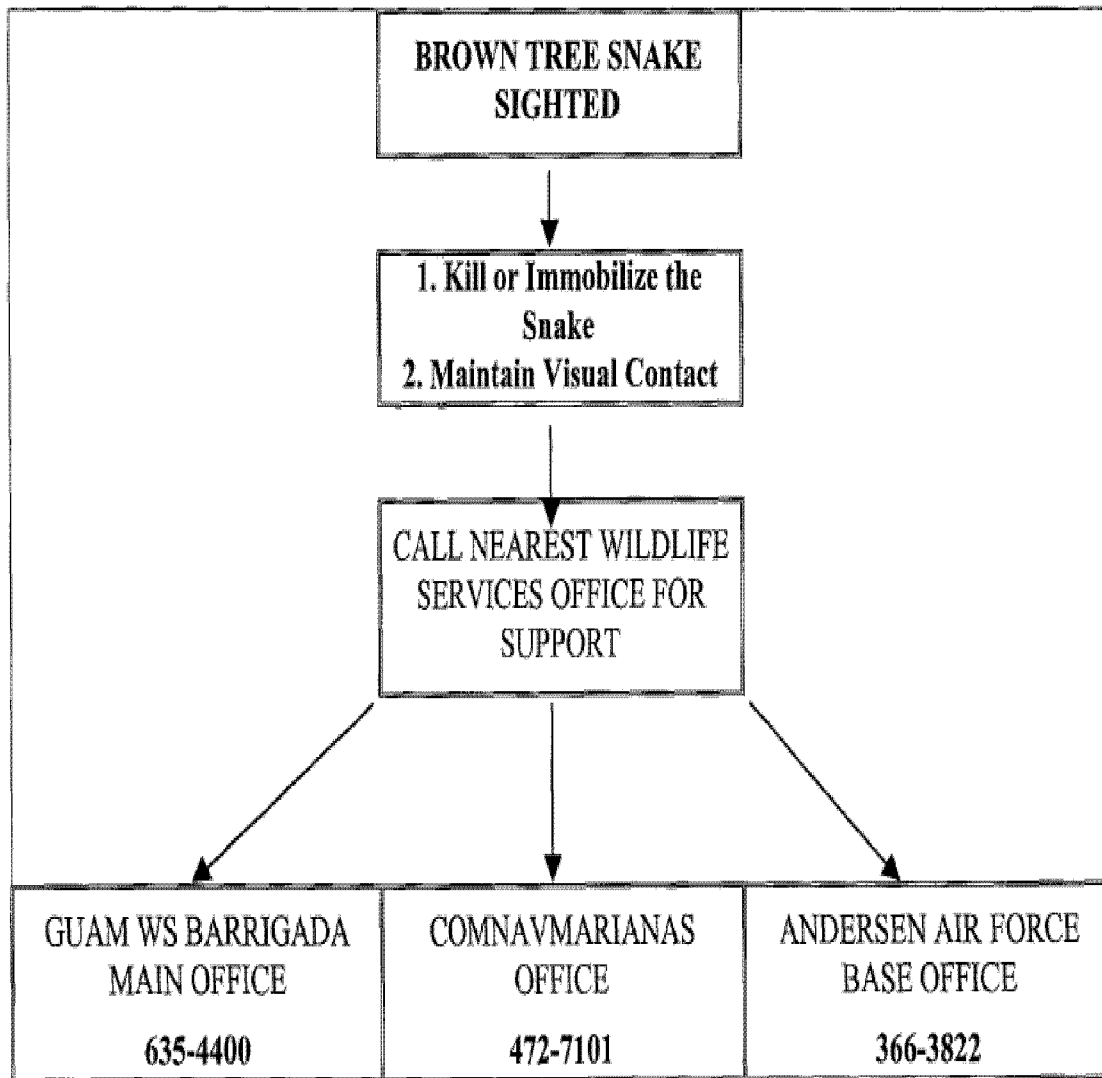
6.3.3. HSC-25 will also brief USDA WS inspectors of any known cargo transport missions during their morning inspection, to assist USDA WS in making arrangements for an inspection with the unit that owns the cargo.

6.4. Documentation Requirements. USDA WS will notify 36 WG Command Post upon completion of HSC-25 aircraft inspections, using the tail numbers of inspected aircraft as a reference. 36 WG Command Post will annotate completed inspections in the Access database, annotating the entry with the initials of the USDA WS personnel making the notification.

A handwritten signature in black ink, appearing to read 'M. R. Boera', with a stylized, cursive script.

MICHAEL R. BOERA, Col, USAF
Commander, 36th Wing

Table 1: BTS Emergency Response Procedures



* This chart refers to brown tree snakes found in cargo and cargo or flightline areas only. If brown tree snakes are found in residential areas there is no need for residents to notify Wildlife Services. Residents can just kill and dispose of the snake.

Attachment 2. BTS Inspection Contact Information.

Subject: USDA Canine Inspection Contact Phone Numbers

Date: March 15, 2006

To: All Cooperators

USDA-Wildlife Services canine inspection hours and contact telephone numbers are listed below. Please take note of the different telephone numbers for locations north and south of the village of Hagatna.

MONDAY-FRIDAY

	<u>North of Hagatna</u>	<u>South of Hagatna</u>
2200 – 0530 hrs:	888-5708	888-5706
0530 – 2200 hrs:	888-5707	888-5705

SATURDAY-SUNDAY

Call 888-5705 or 888-5709 regardless of location.

If no message can be left at the phone numbers listed above, please try to contact our Andersen AFB Team Leader at 888-5713, or Navy Team Leader at 888-5727 to schedule an inspection.

If you have any questions or concerns in regards to this memo, please feel free to contact me at Andersen AFB at 366-3822.

Sincerely,

Jason C. Gibbons
Supervisory Wildlife Biologist
Canine Program Manager, Acting
USDA/ APHIS/Wildlife Services, Guam

	Water Well Development Area	0.01	0.01	0.05	0.01
	Stand Alone Hand Grenade	0.00	0.00	0.06	0.00
	Live Fire Training Range Complex - KD Ranges	16.28	16.28	20.49	15.54
Electrical, Wastewater, and Water Off Site Utilities		2.99	5.04	27.83	4.28
	Cantonment U&SI Phase II	0.05	0.05	5.84	0.05
	Water Well Development Area	1.02	1.02	0.32	1.02
Water Well Development Area		79.47	79.47	10.22	79.47
Live Fire Training Range Complex - MPMG		62.63	80.50	27.05	80.50
	Live Fire Training Range Complex - KD Ranges	4.75	13.43	12.34	13.43
Live Fire Training Range Complex - KD Ranges		115.99	134.78	45.96	134.04
Live Fire Training Range Complex - USFWS Relocation		2.88	12.51	0.00	12.52
Stand Alone Hand Grenade		0.00	0.00	21.51	0.00
AAFB - Expand Middle School		0.00	0.00	0.00	0.00
Guam High School Expansion		0.00	0.00	2.08	0.00
Recycle Center		4.80	4.80	0.24	4.80
9th ESB (-)		16.82	16.82	0.00	16.82
9th ESB HQ		2.58	2.58	0.00	2.58
MC&FH Finegayan Blue Box Area Outside U&SI Projects		113.95	121.36	119.97	121.36
TOTAL RECOVERY HABITAT IMPACT - FEIS 2010 ROD Related Actions and DSEIS 2014					
Project Footprints		897	1281	999	1276

Data Sources: MC&FH Finegayan CDP (12/19/2013); LFTRC Northwest Field CDP (11/27/13); Guam Rainbow Chart 3/17/2014

	Stand Alone Hand Grenade	0.00	0.00	0.06	0.00
	Live Fire Training Range Complex - KD Ranges	16.28	16.28	20.49	15.54
Electrical, Wastewater, and Water Off Site Utilities		2.99	5.04	27.83	4.28
	Cantonment U&SI Phase II	0.05	0.05	5.84	0.05
	Water Well Development Area	1.02	1.02	0.32	1.02
Water Well Development Area		79.47	79.47	10.22	79.47
Live Fire Training Range Complex - MPMG		62.63	80.50	27.05	80.50
	Live Fire Training Range Complex - KD Ranges	4.75	13.43	12.34	13.43
Live Fire Training Range Complex - KD Ranges		115.99	134.78	45.96	134.04
Live Fire Training Range Complex - USFWS Relocation		2.88	12.51	0.00	12.52
Stand Alone Hand Grenade		0.00	0.00	21.51	0.00
AAFB - Expand Middle School		0.00	0.00	0.00	0.00
Guam High School Expansion		0.00	0.00	2.08	0.00
Recycle Center		4.80	4.80	0.24	4.80
9th ESB (-)		16.82	16.82	0.00	16.82
9th ESB HQ		2.58	2.58	0.00	2.58
MC&FH Finegayan Blue Box Area Outside U&SI Projects		113.95	121.36	119.97	121.36
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